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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

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FLASHES AND PLUGS

OFFICIAL ENVOY. The sight of a man walking on the stone ledge outside the circuit attorney's office on the third floor of the St. Louis municipal courts building at 6:20 a.m., recently, prompted someone to call police.

Two officers in a scout car were sent to investigate. When they arrived the man had disappeared.

Presently a window was opened and he stepped out again, unperturbed by the fact that the policemen were showing much interest in him.

He had no reason to be concerned, as it turned out. He was there on business—washing windows.

•

TEAMWORK. "I want to report a burglary," the voice on the police telephone said. The dispatcher told the caller he would switch him to the detective division.

"Well, you wait a minute—I'm the burglar," the voice stated. The caller said he was at a certain music shop and the dispatcher asked if he were going to stay there.

"Sure I'm going to stay here, I can't get out."

Officers arrived, found a man sitting calmly inside the store, and held him as a burglary suspect.

•

FATE'S UNKIND CUT. A Philadelphia radio station called a St. Louis matron recently with good news.

But she was not at home, having left last month for a European trip with her husband. And she was not expected back until the end of July.

It was all very ironical—the telephone call was to inform her she had won first prize on a radio program: a trip to Spain!

•

MILD UNDERSTATEMENT. The news director of radio station KGKO in Dallas, was at work one night recently when his wife called and asked if he wanted an exclusive story.

He replied yes, so she said: "I don't know how to say it, but our house is on fire."

•

HAPPENSTANCE. The telephone number of the United Nations switchboard in the basement of the Veterans' Building in San Francisco, is, appropriately enough, UN 3-4900.

It was just a lucky coincidence, though, because the Veterans' Building number ordinarily is UNderhill 3-4900.

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the PROS and CONS of the

LEAD CALCIUM BATTERY

By **HENRY E. JENSEN***

MUCH CONFUSION has resulted relative to the merits of the lead calcium battery. This is to be expected since almost all commodities which differ in any or all major respects from those commodities which have enjoyed widespread use in the past, must first be proven to have major advantages in costs, life, reliability or maintenance. To better understand the basic advantages of the lead calcium battery a summary of the various pros and cons encountered to date are discussed as follows:

STATEMENT. **The lead calcium battery is a true lead acid battery and operates on the same basic principles as any other lead acid battery.**

FACT. The only basic difference between a lead calcium battery and a conventional lead acid battery is that calcium is alloyed with lead as a hardening agent to increase the tensile strength of the lead instead of antimony normally used for this purpose. In general, the construction, size, weight and output of the lead calcium and the conventional lead antimony battery are the same.

The basic and useful reactions which occur in any lead acid storage battery are the same regardless of the composition of the grid. These are the reversible reactions which deliver useful current to the discharge circuit during discharge or the storage of chemical energy from the charging circuit. These reactions are the conversion of sponge lead (active material) in the negative plates, lead peroxide (active material) in the positive plates and sulphuric acid (electrolyte) to lead sulphate and water during discharge and the reverse reactions during charge.

A second class of reactions which occur within the lead acid battery are all the other side reactions which are undesirable and occur during cell operation. These include self-discharge of the plates, the evolution of hydrogen and oxygen by decomposition of water during overcharge, the release of antimony from the positive grid (in the lead antimony cell) and its deposition on the negative plates, and the corrosion of the positive grid. It is the relation to the second class of reactions that the composition of the grid alloys modifies cell performance. Calcium is electro-negative-to-lead and, therefore, unlike antimony does not deposit on the negative plates and, as a result, does not increase the self-discharge or local action as antimony does. Thus, the cell is much more efficient, will yield longer life (since it does not require nearly as much overcharge to offset these side reactions) and reduces maintenance to a minimum.

STATEMENT. **The lead calcium battery is new and untried.**

FACT. False. Basic research and development on the lead calcium battery was started 23 years ago at Bell Telephone Laboratories which activity provided the necessary research and facilities for its development. During this period a vast number of tests both in the laboratory and field on this battery have been in progress. Few other commodities have had such an extensive time period to prove their merits.

These tests have shown that this battery is both scientifically sound and commercially feasible. Full-scale production involving millions of dollars annually has been accomplished over the last five years. Experience over this period of time has shown that the battery is meeting all calculated and predicted results when the batteries are properly manufactured and applied. Over 100,000 cells ranging in size from 180 to 1,680 ampere-hours are in telephone service and many others ranging in size from 10 ampere-hours to 1,000 ampere-hours are in other types of stationary and mobile service.

STATEMENT. **Considerable voltage variations were found to exist in many installations which did not respond to normal restoration procedures used for conventional lead acid batteries.**

FACT. True. The cause of such variations, however, was found to be wholly due to shortcomings in its basic manufacture or materials and not a true characteristic of the battery. Initially, battery manufacturers endeavored to apply the same manufacturing and processing methods used for the conventional lead acid battery, but soon realized that there were many changes that had to be accomplished since the lead calcium battery does not have the marked side reaction caused by the presence of antimony in the conventional lead acid battery to mask all small inequalities.

It was found that the lead calcium cell had to be much more closely controlled throughout its manufacture to ascertain that no undue amount of impurities were present in the basic ingredients and various components used in its makeup. Also, it was necessary to assure that the forming process

*Mr. Jensen is vice president in charge of engineering of C & D Batteries, Inc., Conshohocken, Pa.

was wholly complete, generally by several charge and discharge cycles to condition or balance the cells before shipment. The necessary material and process control are, therefore, considerably more stringent than that normally applied to antimony batteries but are well within practical manufacturing and cost limitations.

Practically no difficulties are encountered with today's product and production and in those infrequent cases when such difficulties do appear they can always be traced to some error in the oversight of quality control, inadvertent addition of impurities or improper installation. Variations are, therefore, the result of some improper procedure and not due to the basic scientific principal of the lead calcium cell.

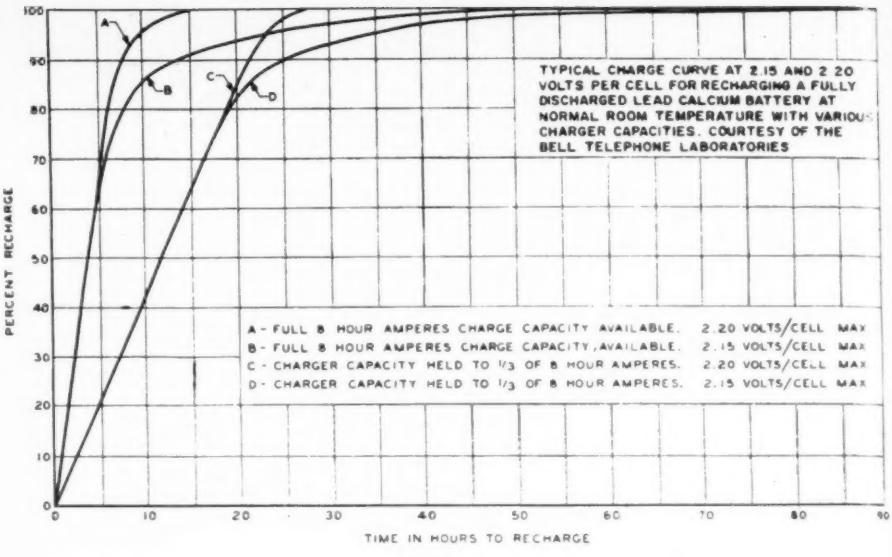

TYPICAL CHARGE CURVE AT 2.15 AND 2.20 VOLTS PER CELL FOR RECHARGING A FULLY DISCHARGED LEAD CALCIUM BATTERY AT NORMAL ROOM TEMPERATURE WITH VARIOUS CHARGER CAPACITIES. COURTESY OF THE BELL TELEPHONE LABORATORIES
A - FULL 8 HOUR AMPERES CHARGE CAPACITY AVAILABLE. 2.20 VOLTS/CELL MAX
B - FULL 8 HOUR AMPERES CHARGE CAPACITY AVAILABLE. 2.15 VOLTS/CELL MAX
C - CHARGER CAPACITY HELD TO 1/3 OF 8 HOUR AMPERES. 2.20 VOLTS/CELL MAX
D - CHARGER CAPACITY HELD TO 1/3 OF 8 HOUR AMPERES. 2.15 VOLTS/CELL MAX
PERCENT RECHARGE
TIME IN HOURS TO RECHARGE

Fig. 1

STATEMENT. **Lead calcium cells cannot be recharged in the same time required for conventional lead acid cells.**

FACT. False. The ability of the lead calcium cell to accept charge under any type of charging conditions; i.e., either constant current or constant voltage is equal to that of any other type of lead acid cell. Actually the charging efficiency of the lead calcium cell is better than that of any lead acid cell containing antimony. *Figs. 1* through *5* show typical charging curves under different conditions of charging and are self-explanatory.

Since the fully charged terminal voltage of the lead calcium cell is considerably higher than that of the conventional lead acid cell, less current at constant voltage will flow through the cell *once it is charged.* Less gassing will, therefore, result so the specific gravity at the top of the cell will lag considerably behind the true value, whereas, the specific gravity of the conventional cell will appear to be higher due to the accelerated mixing caused by the greater gas evolution of the conventional cell.

This condition has given rise to the misunderstanding that the calcium lead battery is difficult to charge because the specific gravity at the top of the cell does not reach the top value for a longer period of time especially when the cells are charged by constant voltage of 2.30 volts per cell and lower.

The lagging of the specific gravity is a disadvantage of the lead calcium cell since it cannot readily be used as a criterion to determine the state of charge so other methods must be resorted to. One method, shown in *Fig. 1*, is the time method whereby it is known that a certain amount of charge is restored in a specific number of hours for various values of bus voltage re-

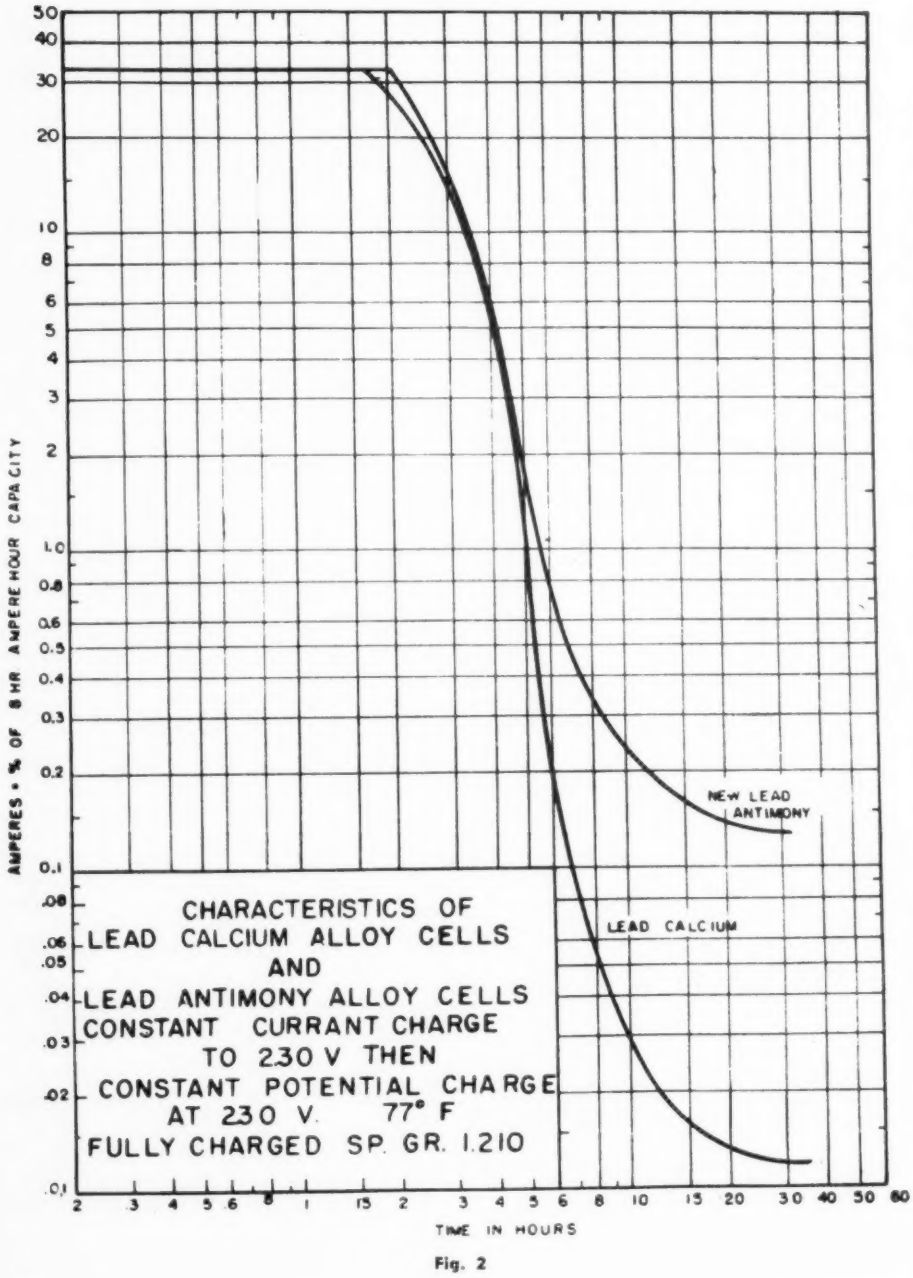


Fig. 2

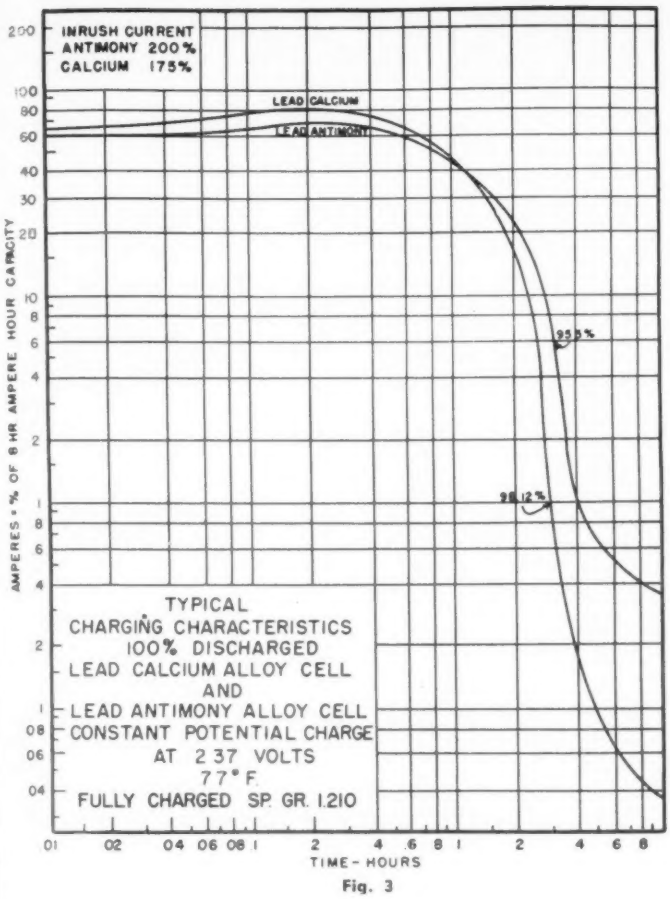


Fig. 3

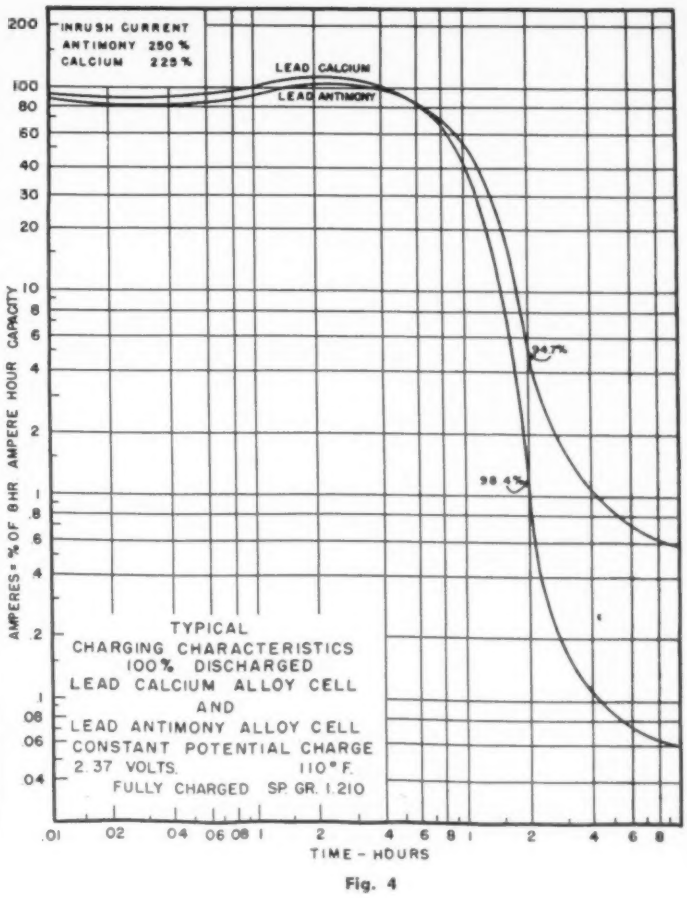


Fig. 4

gardless of the specific gravity reading. Even when the cells are charged back at 2.15 volts per cell from a 100 per cent discharge only 55 hours are required, if the charging source is sufficiently large to permit the 8-hour charge rate to flow. This time is reduced to 15 hours at 2.20 volts per cell.

Another simple method which will give a good indication of the state of charge of the lead calcium battery is to notice the difference between the output ammeter of the charging source and the load ammeter, in installations having both these instruments. The difference between these two instruments is the amount going through the battery. If this difference is small, such as less than 0.5 amperes per 100 ampere hours of battery size, the cells are more than 99 per cent charged. A good rule of thumb is that when the cells are charging at 2.30 volts per cell, the current flowing through the cells is approximately equal to the number of ampere hours left to restore; i.e., if the current is reading 5 amperes per 100 ampere hours the cell is 95 per cent charged; one ampere 99 per cent charged, etc.

STATEMENT. Lead calcium cells cannot be cycled.

FACT. False. Numerous tests, both in the laboratory and field, have proven without doubt that the heavy grid lead calcium battery can be satisfactorily cycled. As indicated above, the only basic difference between the lead calcium battery and the lead antimony battery is in the hardening agent of the lead alloy used in the grid metal. Calcium will harden lead or increase the tensile strength of lead equally as well as antimony. Neither the calcium or the antimony have any prime functions in the battery other than their ability to harden lead.

Accordingly, any well-designed lead acid cells having sound homogeneous grids, completely effective retention media for the positive active material, satisfactory separation and negative plates can be satisfactorily cycled providing the grid alloy is sufficiently resistant to corrosion.

Many tests have shown that the corrosion rate of lead calcium alloy is comparable to that of lead antimony. In other words, at any given current density per unit area the depth of penetration of the corrosion products of both the lead calcium and the lead antimony are approximately the same.

Possibly the reason for this erroneous belief that lead calcium cannot be cycled, stems from the data obtained on the early light-grid lead calcium batteries tested in accordance with standard laboratory accelerated tests, which utilize extensive overcharge as a criterion in determining the life factor. The quality of these early grids was very poor since they contained many dross inclusions and flaws caused by casting the calcium lead in a conventional manner normally used for casting lead antimony grids. As a result, they failed considerably faster than lead antimony cells which had good quality grid castings thereby establishing the belief that they could not be cycled. Subsequent research and development have accomplished methods which now obtain good sound homogeneous lead calcium grids equal in quality to the best lead antimony grids.

Actually, the lead calcium battery designed for cycle service should yield considerably better life on cycle service than the lead antimony battery for the same reason that it gives marked increase in life on float service. This is due to the fact that the battery requires very little overcharge to restore it to full charge because of its extremely low internal losses. Less overcharge in turn results in less grid corrosion, consequently longer life, providing the active material in the positives is not allowed to shed from the grid. Extremely effective retention used in some types of batteries today fulfills this requirement very satisfactorily.

STATEMENT. The lead calcium cell requires fewer equalizing charges.

FACT. True. Especially if floated at 2.17 to 2.20 volts per cell. Once the cells have been equalized immediately fol-

lowing installation, the lead calcium batteries require very few equalizing charges. This is due to the fact that the internal losses are extremely small, so the reason for the cells becoming unequal is largely eliminated. In the conventional lead antimony cell the deposition of the antimony, dissolved from the positive grids, causes side reactions to occur at the negative plate. These side reactions are not equal in all cells, so frequent equalizing charges are required to restore all cells to the maximum fully charged level. Equalizing charges of the lead antimony cells become more frequent as the cells age since more and more antimony is deposited on the negative plate.

In the lead calcium cell the losses are due to the minute impurities encountered in the basic materials since the calcium does not deposit on the negatives nor enter into side reactions such as occur in the antimony cell. The effect of these impurities is extremely small, since many tests have shown that even if cells were not floated at all but left on open circuit their loss of charge would be less than 10 per cent per year.

Equalizing charges, therefore, are only infrequently required if cells are floated at 2.15 volts per cell. If voltage is increased above this value, approaching 2.20 volts per cell, equalizing charges will become more and more infrequent and at 2.20 volts per cell they become unnecessary as shown by numerous tests run over a period of several years.

Floating at 2.17 to 2.20 volts per cell is not considered harmful since it will not shorten the life of the cells within practical limits. This is due to the fact that the current passing through the lead calcium cell is so extremely small (only about 1/10 to 1/75 as much as that required for a lead antimony cell at any given voltage).

A good criterion in determining when lead calcium cells require an equalizing charge, is when the lowest cell in the string drops below 2.13 volts. Cells should then be charged at the highest voltage the system can tolerate such as 2.30 volts per cell until the lowest cell is within .05 volts of the average of the string. This may take considerable time since the current through the cells even at this raised voltage is extremely small.

STATEMENT. The lead calcium cell requires less maintenance.

FACT. True. In general, maintenance of a stationery or telephone battery can be reduced to two basic items, namely watering and equalizing charges. Since the current through a calcium battery on float is only a small fraction of that

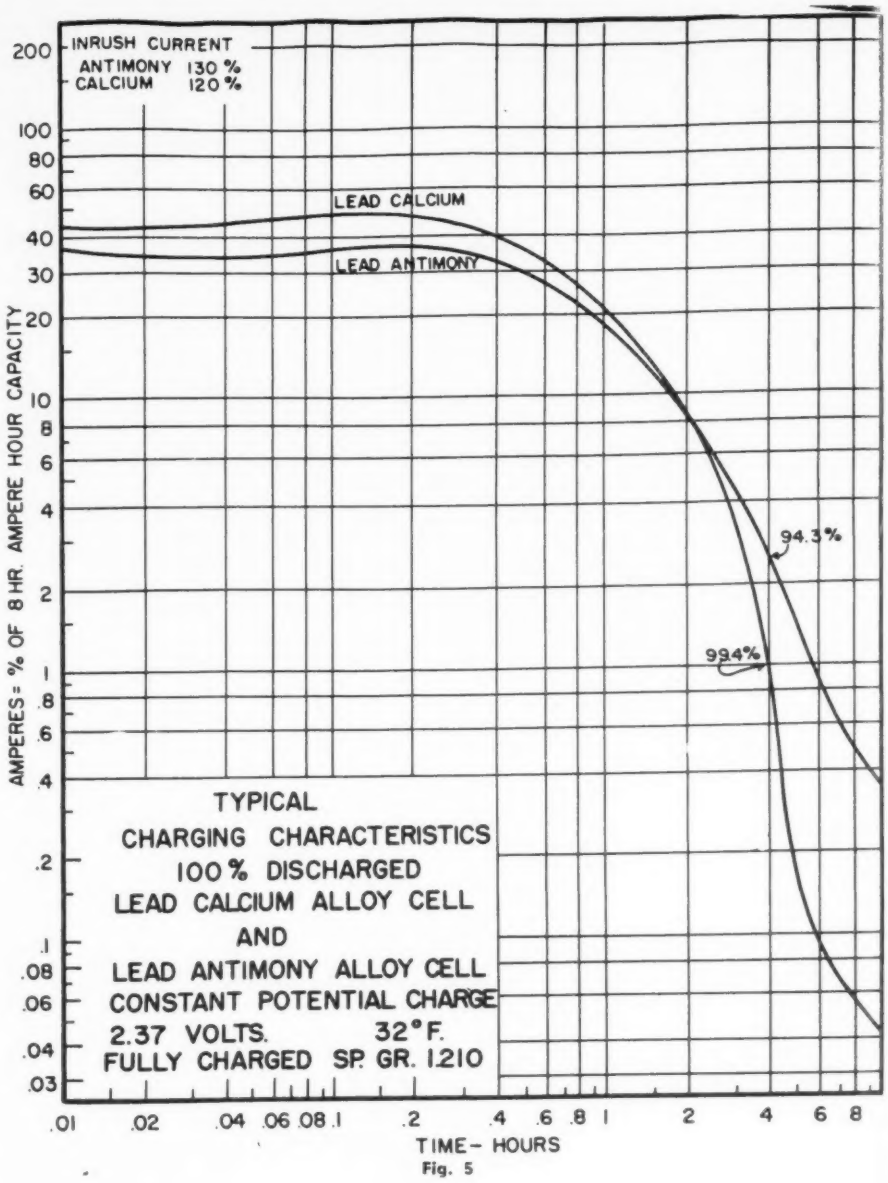


Fig. 5

required for the conventional lead antimony cell the decomposition of water is likewise proportional. Many lead calcium batteries have not required water in two to three years and in one installation no record of water in five years. Equalizing charges likewise are required less frequently as outlined above thereby reducing the maintenance to a minimum.

STATEMENT. Only distilled water can be used for watering lead calcium batteries.

FACT. False. Any filtered water approved for use in a standard lead antimony battery may be used in the lead calcium battery. The amount of impurities in approved water is extremely small and, when you consider how infrequently calcium batteries require water, the total amount of impurities is therefore inconsequential.

Any battery manufacturer will analyze (usually without charge) the water which is intended for use in the battery. If the water has not been approved, a sample should be forwarded to the battery manufacturer for analysis and comments.

STATEMENT. Lead calcium batteries cannot be paralleled with lead antimony batteries.

FACT. False. The lead calcium battery will operate satisfactorily in parallel with any lead antimony battery. The initial charge following installation should be given separately, however, if possible, to prevent undue overcharging of the lead antimony battery. An activity which has both lead antimony and lead calcium cells in parallel should operate the entire installation in accordance with the requirements of the lead antimony batteries. A relatively frequent equalizing charge that is required for the antimony battery will not be harmful to the lead calcium battery.

After termination of the life of the lead antimony battery the activity should resort to the simplified method

(Please turn to page 45)

let's talk FIRE protection

By Mark Brosier *

Chicago Tribune Photo

THE OBJECTIVES of fire protection in the order of their importance are (1) to prevent fire from starting, (2) to prevent loss of life and property in case a fire does start, (3) to confine a fire to the place of origin, and (4) to extinguish a fire.

Before any organization can be trained to the best advantage, all concerned must know something of its work. Knowledge of the job, plus appropriate training, results in increased efficiency. In some jobs it is possible to wait until a problem presents itself before a solution must be found. Fires, however, call for immediate action. Therefore, anyone who has agreed to assume responsibility for plant fire protection must anticipate what could happen. The action should be almost automatic.

The three fundamental factors which apply in the operation of a telephone company also apply in fire protection. They are: (a) material, (b) equipment, and (c) personnel.

In the case of fire, protection must be given the materials from which products are made; equipment must be protected against damage by fire or water, and personnel must be trained in the prevention and control of fires. Thorough instruction should be given personnel in regard to their own safety.

To make fire protection effective, all plant employes should know what to do in case fire does hit. All telephone plants can be made fire safe, whether they are large or small, by having fire first-aid equipment.

One of the most important pieces of knowledge is to know how and where to report a fire quickly. A card having instructions for reporting fires should be prominently displayed. A check with the local fire department should be made on how to report fires correctly to them. Hundreds of telephone exchanges are the fire emergency reporting agencies in their communities.

Fire Extinguishers. Just as a medical first-aid kit is essential for minor injuries and for more serious injuries "while waiting for the doctor," there should be a "fire first-aid kit" to be used for minor fires while waiting for the fire department. Fire extinguishers are absolutely necessary for fire safety. There are many kinds of fire extinguishers. Unfortunately, no one kind will control *all* types of fires effectively. But here are some general rules which apply to all fire extinguishers:

(1) All employes should learn how to use extinguishers effectively.

(2) Follow the directions of the manufacturer for refilling or charging maintenance and operation.

(3) Check your extinguishers every six months to see that they are in good working order.

(4) Keep extinguishers in regular and definite places so you will know where they are when needed.

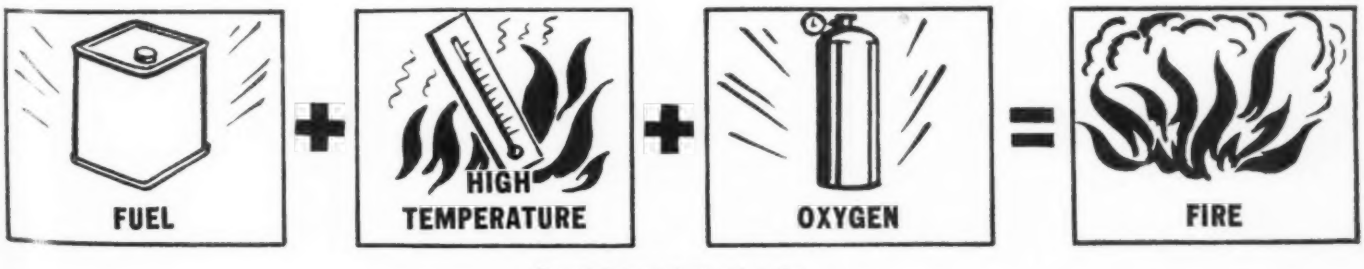
(5) Clearly mark the place for keeping a fire extinguisher. (For example, have a red background for the extinguisher with a red bar below, at the floor level or on the floor, and one above.)

Types of Fires

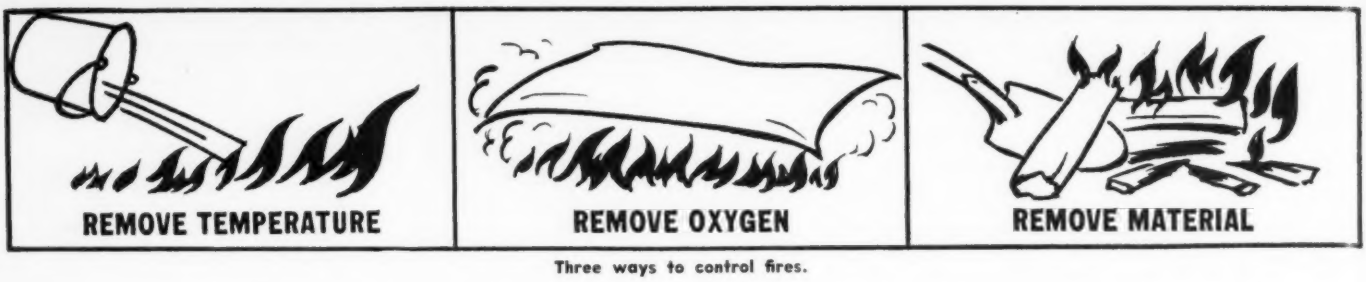
Since there are different kinds of extinguishers for various types of fires, it's a good idea to know about these types of fires—and to know which extinguisher is best to control each type. There are three main types of fires:

CLASS A. Wood, trash, paper and similar combustible materials. These fires are best controlled by quickly

* Mr. Brosier is supervisor of Firemanship Training, Engineering Extension Service, Iowa State College.



Essential ingredients of a fire.



Three ways to control fires.

quenching or cooling with water or with extinguishers using large percentages of water.

CLASS B. Grease, oil, gasoline and other flammable liquids. These fires are best controlled by smothering or blanketing to cut off the oxygen supply.

CLASS C. Electrical equipment, motors and generators. Here it is important to use an extinguishing agent which does not conduct electricity nor injure the equipment.

Try to remember this "ABC" classification. It will help you select the right extinguisher. Extinguishers carrying the label of the Underwriters' Laboratories (UL) or the Factory Mutual Laboratories (FM) have been tested and have met exacting requirements of safe construction and performance.

In the case of the UL label, extinguishers are classified according to the class of fire with which the extinguisher is effective. An extinguisher rated "A-1" will extinguish a deeply charred fire in a standard 10 foot by 10 foot latticed wood panel. It takes two extinguishers rated as "A-2" to put out the standard 10 by 10 panel. To rate "B-1", an extinguisher must be able to put out (1) a fire of two gallons of gasoline in a round tank, 4 feet in diameter, 23 inches deep with 10½ inches free board to water under the gasoline, and having 20 seconds to preburn, or (2) a fire of one gallon of gasoline on an 8 foot by 4 foot area on concrete with no preburn.

To be suitable for Class C fires, the extinguishing agent must be a nonconductor of electricity, and it must have a small amount of extinguishing value on Class A materials. Often, extinguishers are rated as effective with two different classes of fire such as "A-1—B-1" or "B-2—C-2."

Choosing an Extinguisher

Fire extinguishers should be chosen on the basis of their suitability to deal with the particular fires that might be expected in a particular occupancy or property. The principal types are:

WATER SOLUTION EXTINGUISHERS:

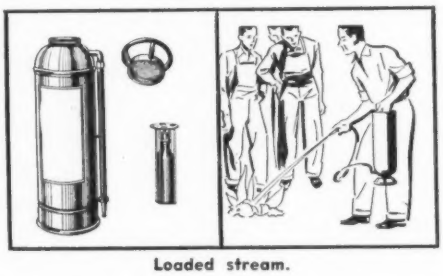
(1) *Plain Water*—Pails, pump tanks, extinguishers operated by a carbon dioxide cartridge.

(2) *Calcium Chloride Solution*—Operated by a fuse or carbon dioxide cartridge.

(3) *Soda Acid*—Sodium bicarbonate solution and sulphuric acid chemical reaction.

Soda acid.

(4) *Loaded Stream*—Potassium carbonate and special salts, operated by a carbon dioxide cartridge.



Loaded stream.

(5) *Foam Extinguishers* — Solution of aluminum sulphate and sodium bicarbonate plus a stabilizer.

CARBON DIOXIDE EXTINGUISHERS: Compressed gas.

DRY CHEMICAL: Specially treated sodium bicarbonate expelled by compressed gas.

VAPORIZING LIQUID: Specially treated carbon tetrachloride or chlorobromethane pumped or discharged by compressed gas. There are five cautions to be observed with the use of vaporizing liquids:

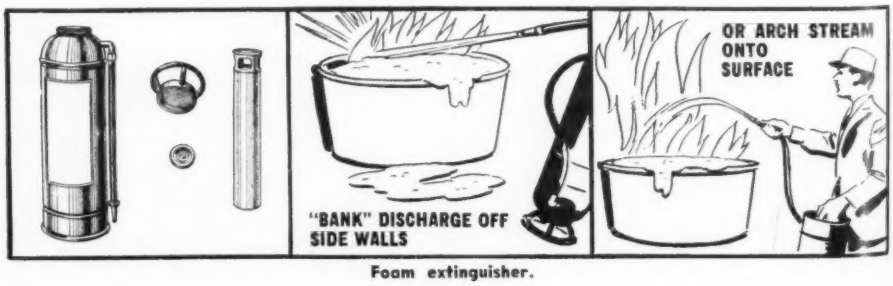
(1) They are volatile solvents and have harmful vapors.
(2) There should always be adequate ventilation after their use.
(3) Avoid prolonged or repeated breathing of the vapors.
(4) Avoid prolonged or repeated contact with skin.
(5) Do not take internally.

Controlling "A" Fires

The majority of fires are Class A fires and they often result in large financial losses. It is the one type of fire for which one should be prepared.

WATER PUMP TANK EXTINGUISHER: The number one extinguisher is the water pump tank. This extinguisher

Water pump tank extinguisher.



Foam extinguisher.

not only is effective with the most common type of fire, Class A, but is also economical to purchase and refill.

This extinguisher should be protected from freezing. One anti-freeze is calcium chloride (granulated 75 per cent) at 3½ pounds to a gallon of water. You can buy calcium chloride charges which include rust inhibitors. After use, the extinguisher should be well washed with clean water. Pump and hose should be empty before refilling.

Pump tanks usually are equipped with a hose 2 to 4 feet long. But you can increase their effectiveness by replacing with a 20- to 25-foot hose.

"B" and "C" Fires

VAPORIZING LIQUID EXTINGUISHERS: These are the most common of the chemical extinguishers. They are for both "B" and "C" fires. Basic material in these extinguishers is carbon tetrachloride in liquid form. To use them, follow instructions on the name plate. Carbon "tet" extinguishers should not be expected to control Class A fires other than very small ones.

To refill use *only* carbon tetrachloride which has been prepared for fire extinguishers. Commercial carbon tetrachloride contains traces of water which may react to form acids that will corrode extinguisher parts and conduct electricity.

When you play carbon tetrachloride upon a fire, the liquid immediately evaporates and forms a smothering blanket of vapor which is heavier than air and smothers the fire. When you use carbon tetrachloride on flammable liquids in tanks or other containers, direct the stream to hit the opposite side of the container—not directly into the liquid. On other fires, direct the stream at the base of the fire and sweep it with recurrent movements and spurts. Keep a supply of carbon tetrachloride on hand so you can refill the extinguisher immediately after use.

CARBON DIOXIDE EXTINGUISHERS: These extinguishers have become very popular in the last few years. They are easy to handle and quite effective in controlling gasoline and electrical fires. And they are of some value on small Class A fires.

Carbon dioxide extinguishers need special refilling equipment. Some of them must be sent back to the manufacturer for refilling. Find out where you can get the extinguisher refilled at the time you purchase it. Some fire departments have facilities for refilling this type of extinguisher. It is well to have an extra carbon dioxide extinguisher for protection while the used one is being recharged—especially if it must be sent some distance.

Vaporizing liquid (carbon tetrachloride) extinguisher.

Carbon dioxide is an inert gas, heavier than air. Released around a burning object, it replaces or dilutes oxygen until it won't support combustion. As carbon dioxide is expelled from the extinguisher it cools, and about 30 per cent forms into carbon dioxide "snow" or "dry ice." This snow has some cooling effect and may aid in preventing flashback when the fire is small. But this cooling effect is negligible as compared to that of water. Carbon dioxide's principal extinguishing effect is that of smothering.

Discharge the carbon dioxide as near the fire as possible. Apply first at the near edge of the fire and sweep the fire in short, recurrent discharges of the carbon dioxide until the fire is out.

Weigh a carbon dioxide extinguisher at least every six months. If the weight loss is more than 10 per cent of the rated capacity, the extinguisher should be recharged.

DRY CHEMICAL EXTINGUISHERS: These are one of the more recently developed types and there is quite a bit of variation within the type. Nozzles are different—some disperse a broad, fan-shaped stream for greatest coverage at close range and others disperse a narrow, fan-shaped stream to attack fires from a distance.

Dry chemical extinguisher.

The extinguishing agent basically is sodium bicarbonate with added components to produce a water-repellent and free-flowing powder. Powder is expelled by pressure from a carbon dioxide cartridge which must be replaced each time the extinguisher is used.

Weigh the cartridge at least once a year. If the loss in weight is more than that stated on the name plate, replace it. Use only chemicals and cartridges recommended by the manufacturer. (One extinguisher uses air pressure to discharge the powder. It has a pressure gauge, and the pressure may be renewed as needed at any service station.)

Dry chemical extinguishers are effective against both Class B and C fires. The powder has about the same elec-

(Please turn to page 39)

Carbon dioxide extinguisher.

Senate committee holds hearing on amendment to Communications Act governing FCC action in telephone company consolidations. FCC hears petition of Bell companies to purchase privately-owned pipe line communications facilities. REA lends 55 million dollars in fiscal 1955. Independents featured in financial house's report.

THERE APPEARED to be no substantial objections to a bill in Congress, by the Senate Interstate and Foreign Commerce Sub-committee on June 25, to amend the common carrier provision of the Communications Act. The bill (S. 1456) is a very minor one and would simply change certain procedural language so as to allow the Federal Communications Commission (FCC) to step up its handling of telephone company sales and merger applications.

Notwithstanding the apparent agreement between spokesmen for the FCC and the United States Independent Telephone Association (USITA), as well as sympathetic acceptance of the measure by the sub-committee chairman, Sen. John O. Pastore (D., R.I.), it is too late in the session to expect that the bill will get final action this year.

This bill started out as a measure to revise the Communications Act so as to allow the FCC to dispense with formal hearings in all cases involving consolidation, merger, or sale of telephone companies or their major assets or controlling interests.

The only difference of opinion concerned a rather fine point, and was settled amicably enough, between USITA Counsel Bradford Ross and FCC Common Carrier Bureau Chief Harold G. Cowgill.

USITA Counsel Ross had pointed out that the original language of the bill would give the FCC sole discretion in determining whether or not hearings were necessary in so-called acquisition cases involving the sale of telephone company properties. Ross did not think this gave the Independent telephone industry, as such, quite enough protection in cases where Independent companies might wish to protest proposed acquisitions by Bell System companies. Under the new language, which was finally agreed upon, hearings would be held by the FCC in telephone acquisition cases: (1) Where the FCC decided such hearings were necessary, or (2) where a "request therefore is made."

Mr. Cowgill said he was sure the FCC would go along with the amendment designed to give the USITA, or Independent company interests, the right to request and obtain FCC hearings in protested acquisition cases.

There were some other portions of the bill broadening the discretion of the FCC in handling telephone company organization matters in a minor sort of way. Briefly these changes would be as follows: (1) The FCC could dispense with the requirement that applications be made by telephone companies (mainly Bell System companies) for authority to have interlocking directorates, where the companies involved are already under common ownership or control; (2) the FCC could change or simplify annual reporting requirements by telephone companies in particular cases, especially as to miscellaneous or limited operations; (3) an apparent error in a 1952 amendment to the act, covering state commission participation in FCC hearings, would be corrected so as to make it clear that such joint hearings (by FCC examiner-state commission boards) would not be equal in rank or authority to the actions or hearings of the FCC itself. In other words, the joint hearings would have the same subordinate status to the FCC as those conducted by an FCC examiner.

Mr. Cowgill, on behalf of the FCC, explained the need for some of these provisions. He reviewed the unnecessary work which the FCC's staff must now perform in processing, filing, and otherwise handling numerous applications for interlocking directorates or changes, where all the companies involved are already part of a single system. He said it was an unnecessary burden, adding to the work load of both the regulated companies and the FCC.

With respect to giving the FCC discretionary authority over annual reporting, Mr. Cowgill said that the change "would make clear that the commission has authority to tailor the annual reports required from particular types of carriers to the peculiar needs of the commission."

The ready agreement and amicability which marked the Senate sub-committee hearings on this common carrier amendment was in contrast to a Senate sub-committee hearing on another bill to amend the FCC with respect to radio and television license protest.

This is another bill sponsored by the FCC. It would modify Section 309(c) of the Communications Act so as to give the FCC more discretion in determining whether license grants should be held up pending protest filed by parties in interest.

Among the witnesses were FCC Chairman McConnaughey and FCC Commissioner Doerfer, who urged passage of the bill because certain radio and telephone interests are now able to use the "protest hearing" requirements to block and delay commission action and develop a certain amount of nuisance value for protests which have little or no merit. Commissioner Doerfer even went so far as to say that he would like to repeal Section 309(c). Senate Sub-committee Chairman Pastore announced that hearings on the bill would go over until after the July 4 holiday.

Pipeline Telephone System for Sale to Bell

An interesting development in the privately-owned communication field was seen in the filing last month with the FCC of an application by a pipeline company to sell nearly 600 miles of privately-owned communication facilities to the American Telephone & Telegraph Co., Southwestern Bell Telephone Co., and AT&T Long Lines Department. The AT&T petitioned the FCC to permit the sale of the facilities of the Champlin Refining Co. (headquarters at Enid, Okla.) without formal hearing.

Under the proposed deal, in which the Bell System will take over performance of the pipeline system services, several intrastate open wire lines and private mobile radio facilities will be included.

The application claims that the company's privately-owned and operated facilities are not well adapted to meet the growing and exacting communication needs of the pipeline company's business.

It would require substantial additional capital investment to improve and expand them and the pipeline company does not wish to make this additional investment. Instead it desires to turn the responsibility over to regular telephone company operations.

The total purchase price for the wire line and related facilities from Enid, Okla., to Rock Rapids, Ia., would be $65,000, which was said to be less than the structural value of the plant and facilities to be reconditioned for the new service and of the salvage value of certain portions to be dismantled.

REA Lends 55 million in 1955

The Rural Electrification Administration was expected to end its lending program for rural telephone financing during the fiscal year of 1955 with loans totaling about 55 million dollars. Final figures were not complete at the time these lines were written. But REA spokesmen expected that that total would be reached for the rural telephone loan program as of the deadline of the fiscal year, July 1, 1955.

The fiscal year ended in a rush. Rural telephone loans as of June 28, 1955, were tallied at 51 million dollars for the year.

But REA had enough applications in the works to reach the target figure of 55 million dollars on the deadline.

A similar target for rural electrification loans was fixed at 165 million dollars for fiscal 1955.

An REA official said there was no particular effort under way to beat the

Four REA Loans Aid Rural Telephone Service

Telephone companies in Missouri, Louisiana and Mississippi received loans from the REA to improve and extend telephone service in rural areas, the U. S. Department of Agriculture announced on June 17. The four loans amounted to $608,000, as follows:

Goodman (Mo.) Telephone Co., Inc., on June 17 was allocated $128,000 to extend and improve rural telephone service in McDonald County. The Goodman company now furnishes magneto service to 305 subscribers on 44 miles of line.

The REA loan will enable the borrower to convert the system to dial operation and add facilities to serve 132 rural families now without telephones. About 30 miles of the existing line will be rebuilt and 73 miles of new line constructed. The company will build a new automatic central office at Goodman. The expanded system will consist of 103 miles of line.

Roy W. Eppard is president and manager of the Goodman company.

*

Star Telephone Co., Maringouin, La., on June 20 was extended a loan of $245,000, fourth loan to this company. The company plans to use this loan to serve 385 additional rural families within the present service area and 267 families now without telephones in a non-contiguous section in northern Pointe Coupee parish. A new automatic central office building will be constructed at Innis in the expanded territory, and about 136 miles of new line and other facilities added to provide modern dial service to these extra subscribers.

The four REA loans, totaling $546,000, will make possible new and improved service to a total of 1,266 families and other rural establishments. Automatic central offices for the system will be located at Innis, Livonia, Maringouin and Rosedale. The expanded system will consist of 227 miles of line in Iberville and Pointe Coupee parishes.

Louis J. Peranio is president and manager of the Star company.

*

Home Telephone Co., Olive Branch, Miss., on June 22 received an allocation of $43,000, third loan to this borrower. With these funds, the borrower plans to construct 8 miles of line and other facilities to serve 30 new subscribers not included in prior loans, to add 30 extensions and to build a garage-warehouse at Olive Branch. In addition, this loan will be used to complete plans authorized in the first two loans.

The three REA loans, totaling $463,000, will make it possible for the borrower to serve 983 subscribers in Marshall and DeSoto counties, Miss., and Shelby County, Tenn. The new automatic system was placed in service during April 1954, and 885 subscribers already have been connected.

Lon J. Darley, Sr., is president of the Home Telephone Co.

*

Marion Rural Telephone Co., Philadelphia, Mo., on June 24 was allocated $292,000 to improve and extend rural telephone service in Lewis, Marion and Shelby counties. The borrower, a new non-profit organization, plans to acquire the following properties as a nucleaus for the proposed system: The Philadelphia Telephone Co., the Emden Telephone Co., the Warren Telephone Co., and access rights from the Western Light & Telephone Co. to 34 switchers adjacent to the borrower's service area. These facilities are now furnishing magneto service to 391 subscribers.

The mutual company will build a new automatic central office at Philadelphia to serve the whole system. Outside plant will consist of 250 miles of new line when constructed. This expansion will enable the Marion company to furnish improved service to the acquired subscribers and to offer initial service to 255 rural families now without telephones.

E. A. Turnbull is president of the Marion Rural Telephone Co.

fiscal year deadline. It was pointed out that many applications in the works for a long time are coming to a head. He said there is the usual speed-up of fiscal year-end activity, "but actually we've nothing to beat." He added that money REA has available from Congress during one fiscal year does not revert to the Treasury, but is carried over and added to new appropriations.

FCC Splits on Mackay Case

By the close vote of 4 to 3, the FCC last month granted Mackay Radio & Telegraph Co. permission to use radio circuits paralleling the existing lines of RCA Communications between the United States, Portugal, and The Netherlands. This case is known as the "three-circuits" case, and it is the second time in recent years that the commission has authorized a duplication of international telegraphy facilities in this manner.

The majority opinion was handed down by Chairman McConnaughey and Commissioners Hyde, Lee, and Hennock. The dissenting opinion (in favor of denying the duplicate circuit facilities) was signed by Commissioners Bartley, Doerfer, and Webster. The case first started back in 1946 when Mackay asked for circuits with The Netherlands and Portugal and RCA Communications protested.

An original FCC decision (5 to 2) was based on a ruling that competition between these points was "reasonably feasible." This order went to the U. S. Supreme Court and was remanded for further proceedings by the commission.

The main question involved is whether an international telegraph carrier should be protected from competition along the lines of other regulated public utilities or whether "reasonably feasible" competition should be authorized. It is quite likely that the latest decisions of the commission will again be appealed to the federal courts.

Financial House Lauds Independents

The nationally-known financial house of Shearson, Hammill & Co. of New York City recently issued a special report featuring the Independent telephone industry. The report states that, under present conditions and certainly in the foreseeable future, the industry still offers a very fruitful field for the investor.

The reason for the Independents being often passed up is quite understandable, the report stated, because not only does Bell "occupy the field" in a large way, but it is only recently that the smaller companies have been able to show a basically strong financial position.

The report also noted that also during World War II, much new and highly efficient communications equipment was developed for the Armed Services but their shortage for civilian uses discouraged any concerted sales efforts in this field. It was noted that it is now possible to sell the idea of extension telephones, or extension bells, pick-up and hold keys, automatic answering or recording devices, and microphone and loud speaker devices which will find increasing uses in the business world.

The Shearson, Hammill & Co.'s report reviewed the extended use of Independent operations in the United States as compared with Bell system operations ("about one out of every six telephones".) It was noted that these companies have a combined plant investment of nearly 1.5 billion dollars with annual gross revenues of about one-half billion, employing over 100,000 people.

In addition, certain well-known large Independent groups have been experiencing higher earnings.

The Shearson, Hammill & Co.'s report went on to point out the advantages of some of the smaller Independent companies' investments. It said:

"There are other, but smaller, companies which provide opportunities for those prepared to invest in this group even though some have more highly leveraged capital structures and operate in areas perhaps more sensitive to changing business because of the more restricted area served.

"While these companies entail more risk, on the other hand, certain basic factors play a key role in their case and provide a quality out of proportion to size of the company or territory. Some of the factors to be considered are briefly these.

"It is undeniable that most of the smaller companies don't have the resources to carry on the far-reaching and painstaking research which the Bell System provides constantly for its companies and in return for which it collects a fee.

"But it is equally true that the expense of continued research, often of a non-productive though necessary nature, is spared the Independents who ultimately reap its benefits.

"But there is also a more direct way in which they share Bell development expense. *More so than any other segment of the utilities, the telephone industry is interconnected — in fact 100 per cent so of necessity. Therefore, as greater use is made of long distance communication because of highly improved techniques, the Independents are bound to gain through a greater use of their local lines and equipment which might otherwise remain idle.*

"In short, each telephone company stands to gain from the activities of every other, not excepting, naturally, the giant Bell companies.

"The 'toll charges' which result have been one of the significant elements in raising the profits of the smaller companies."

The report went on to explain the way in which toll compensation is divided between Bell and Independent companies and observed that within the past few years the basis for such compensation had been revised by negotiation or regulation, so as to work "gradually in favor of the Independent."

The unity of the nation's telephone system was also said to be the strongest element favoring the Independents. Other favorable factors noted in the Shearson, Hammill report are as follows:

(1) The popularity of extra telephones in the home causes greater use and higher billings.

(2) The profitable toll department is helped by faster long distance service and more self-dialing. Calls originating in the large Bell System can contribute to the income of other companies.

(3) The decentralization of business, by placing branch plants out of town and even in completely rural areas, increases long distance calls.

(4) Before long, practical equipment will be available to permit telephone communication between office or homes and autos, buses, trains.

(5) In a period of declining business, a sales organization can make its contacts over long distance and save expensive travel. Any tendency toward declining commodity prices would also reduce cost of construction and maintenance. For the telephone companies, it is a partial resistance against recessions.

(6) Finally there is the basic population growth at the rate of 2.5 million yearly; and in some areas the growth is more accentuated than the national average.

Idaho Case Enters Fourth Round

Another round in the unusual Idaho telephone rate case, was started last week by the Mountain States Telephone & Telegraph Co. The company is now back before the Idaho Public Utilities Commission with a new application for rate relief which would get the company off the hook with respect to a required refund of 2.5 million dollars, made necessary by the refusal of the Idaho Supreme Court (by a 3 to 2 vote) to allow a second rehearing in the case.

The Idaho commission had originally denied the company's petition for a rate increase filed in 1952. Since 1953, the rate increase has been collected under bond, pending outcome of appellate litigation.

The state court at first unanimously agreed that the commission had erred in refusing the increase and ordered

(Please turn to page 47)

nble?

No unfounded claims, no vague euphemisms are necessary to sell Strowger. The record of many years shows irrefutably, conclusively that:

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AUTOMATIC ELECTRIC

ORIGINATORS OF THE AUTOMATIC DIAL TELEPHONE

THE PLANT MAN'S Notebook

by Ray Blain, Technical Editor

WE ARE IN receipt of a letter from G. H. Reimers, assistant to the president of The Automatic Electric Sales Corp., in which he comments as follows on an item that appeared on this page in the Apr. 30 issue concerning colored telephones:

"The Executive Furniture Guild publishes the booklet 'Prestige,' which has to do with the present trend of color in offices, plants, etc. Their contention is that for years, ever since the roll-type desk joined the dodo and the passenger pigeon in the limbo of things passé, office equipment and furniture has pretty much followed the same general line of design.

"For the past several years, architects, designers and interior decorators have entered the planning field with the idea of attempting to reflect the individual personalities of the executives, and by the use of color are creating a much more pleasant atmosphere for office employes who actually spend more time in the office than in their homes.

"It is a known fact that comfort and beauty add to, rather than detract from, efficiency in the office.

"Just as everyone likes an agreeable, attractive personality, so are the greater number of people drawn to the firm or institution which reflects similar characteristics and attitudes.

"I think you will agree that banks, large institutions and new offices are reflecting considerably more color and comfort in their present surroundings than they did several years back.

"You might be interested to know that several executive office furniture suppliers who come in to see me, have evidenced great interest in the new colored telephones as an important accessory in the office.

"For your information, we have sent to Steelcase, Inc., Merchandise Mart, Chicago, a complete set of our colored telephones which they are using in their various settings of offices equipped with different types of furniture.

"Because of that exhibit, we have now received a further request for a display of our colored telephones to be used in sample offices of an office furniture supplier in Los Angeles.

"I agree with you that the gray telephone presents an excellent appearance in a general office where gray steel furniture is used. However, we are using other colors in our private offices and we have received many compliments regarding them and the way they complement the walnut or mahogany furniture as the case may be."

The use of colored telephones is indeed increasing at a tremendous rate, and the black telephone, like the black automobile, may soon be reduced to limited usage.

•

We are in receipt of a one-sheet supplement from Harry E. Hershey to his book, "Automatic Telephone Practice" on direct distance dialing service. This supplement contains a wealth of information and takes most of the mysteries out of this confusing subject. It is being mailed to all owners of the book on record, Harry informs us.

•

You may have noticed that many of the new mail trucks recently placed in service by the Post Office Department are right-hand driven.

This change is made, we understand, in the interest of safety as it permits the driver to get in and out of the truck easily from the sidewalk side. Perhaps a similar arrangement would prove desirable for light installation and trouble trucks.

•

In Alaska recently, we had the pleasure of examining an installation of Styroflex coaxial cable. It was strung on messenger strand and supported by ordinary cable rings for a distance of about 4,000 feet.

This cable has been in service for about two years and we understand that it has given perfect service.

Rigid co-ax, we were advised, causes considerable trouble in the Arctic because of its excessive expansion and contraction which results from the terrific temperature differential between winter and summer.

•

That the telephone business is booming everywhere these days, none can deny. This includes the installation of extensions because people everywhere are finally learning what telephone people have known all the time: that homes with only a single telephone are usually inadequately served.

Due to the shortages of the war and the "catch-up" years afterwards, only every tenth residence in the Pacific Bell area now has an extension. It is claimed, however, that this condition is changing fast and that the 320,615 residence extensions will increase to 442,800 by the year's end.

Consider, for example, that the Bell System has telephones today in 27½ million homes. And in these homes are at least 55 million bedrooms, 27½ million kitchens, and an equal number of living rooms. Here, certainly, is a situation that points to enough extension sales prospects to keep this phase of the telephone business booming for some time to come.

•

The weather telephone number in Washington, D. C., is being changed from WEather 3-1212 to WEather 6-1212. It is understood that an effort will be made to have all weather forecast numbers uniform throughout the country.

We are heartily in accord with this plan as we have often contended that all special service numbers should be uniform whenever possible.

•

It has been said that there isn't much fun in medicine, but there's a good deal of medicine in fun.

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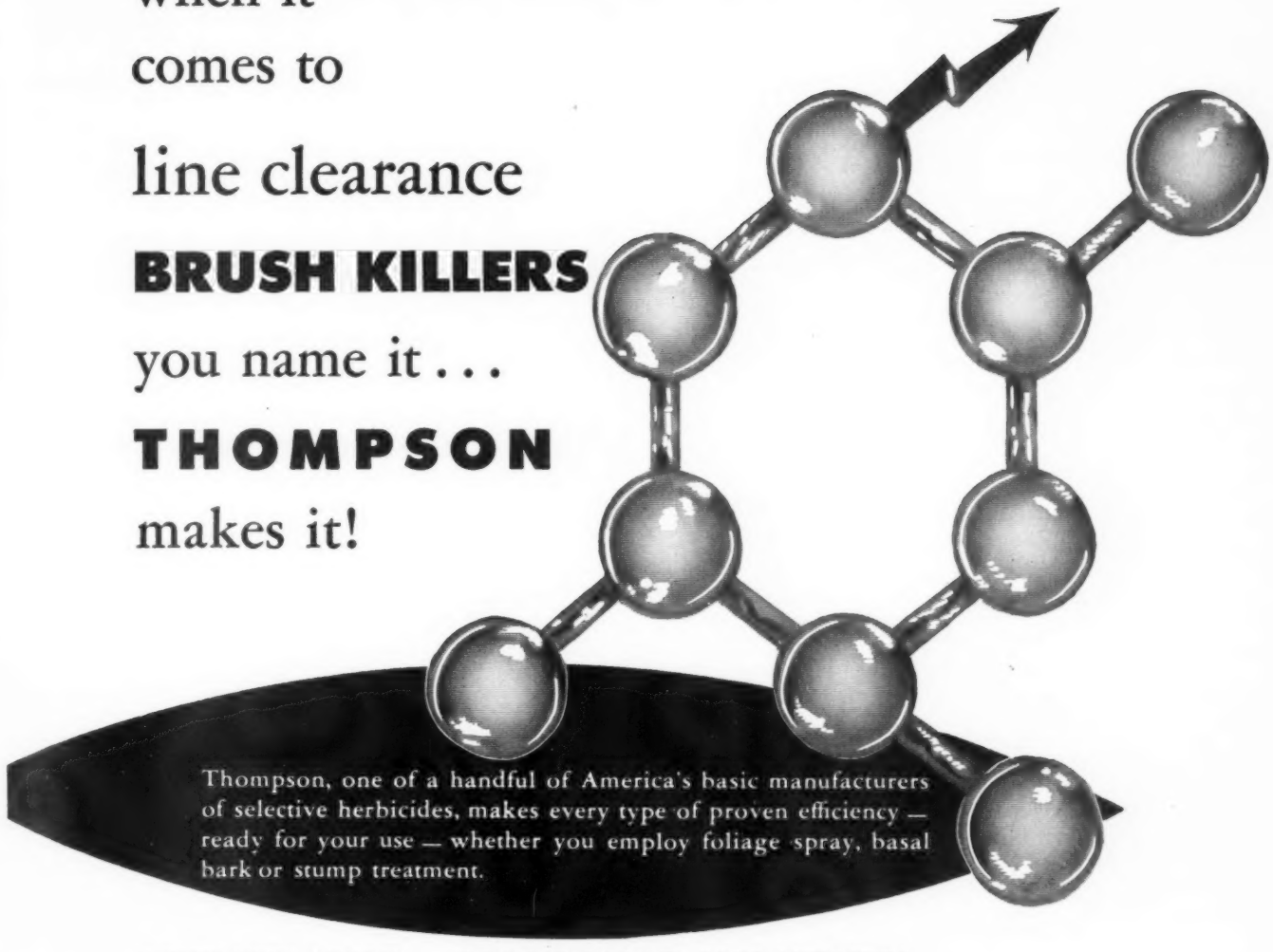

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MERCHANDISING

Stressed at Pennsylvania Convention

By H. D. FARGO, JR.

THERE WAS more to cheer about program-wise than weather-wise at the 53rd annual convention of the Pennsylvania Independent Telephone Association, held on June 1 and 2 at Pocono Manor. Cloudy skies prevailed at the scenic spot but an excellent, well-balanced program rewarded the approximately 400 telephone people who made the trip.

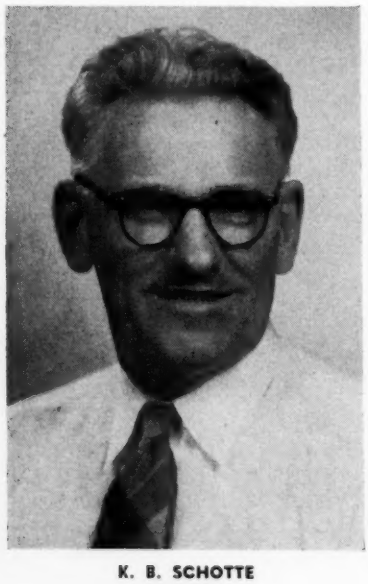
President Franklin Smith, Pocono Lake, presided at the opening session. In his address, he stated dial service has been increased by Pennsylvania Independent telephone companies from 62 per cent to over 75 per cent in the past four years. He pointed out that in recent years the growth of population in suburban areas is exceeding the rate of growth in the larger cities. "With this trend of the population, and of industry and business to locate more and more in the suburbs lies our opportunity and responsibility as Independent telephone people," he said.

Mr. Smith laid emphasis on the importance of a program to sell regular and special telephone services. The fact that the total number of Independent companies is diminishing has, he said, created some fears that they are not holding their own; however, the truth is that much more business is being done, even though by fewer companies.

A very complete report was given by Executive Vice President A. C. Herbert, covering the association's activities. Although the Independent station growth in 1954 was only 24,000 stations (about 13,000 less than the previous year), the growth for 1955, based upon the first three months figures, should be 40,000. "For the first time in six years our (Independent) percentage growth did not exceed that of the Bell Telephone Co. of Pennsylvania," he said. "We both had gains of about 4.1 per cent." Reasons for the improvement this year were general upswing in business and increased sales promotion, he said.

Plant investment per Independent telephone went up from $212 to $224; this is still $34 below the Bell of Pennsylvania, Mr. Herbert reported. New securities registered for Independents by the state commission during 1954 totalled $8,719,250 of which 58 per cent was in debt financing, 30 per cent in preferred stock and only 12 per cent in common stock. Total operating revenues were almost 35 million dollars or about $60 per telephone, which is $4.00 more than a year ago.

"We had about 5,300 employes who earned about 16 million dollars in wages and salaries, or one employe for every 110 telephones," said Mr. Herbert. "This is much better than the



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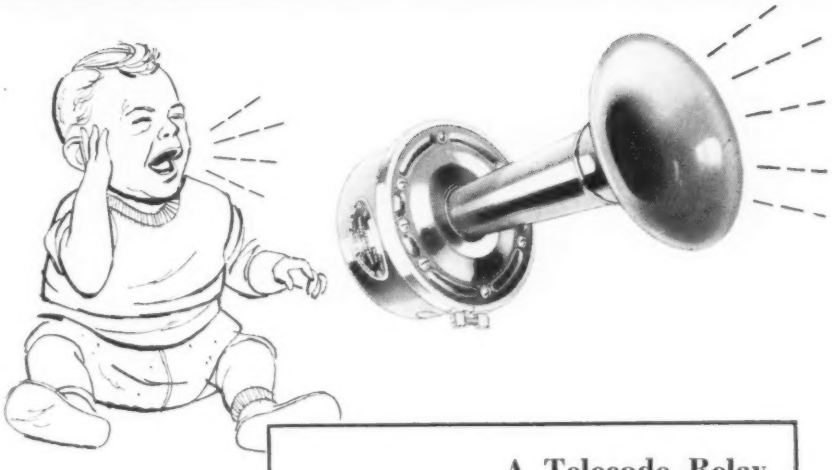


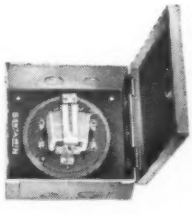
They both command attention!

A Benjamin industrial howler, like a baby, can never be ignored. Its insistent, urgent tones cut through the din of the noisiest production shop. The phone is answered quickly, messages come through, instructions are carried out. This makes your industrial subscribers happier because they get more value from their telephones. And it means an extra bit of revenue for you.

Benjamin howlers are furnished weatherproof or non-weatherproof, for outside or inside installations. They operate on 110 volts, 60 cycles AC. Order from the nearest Automatic Electric warehouse today.

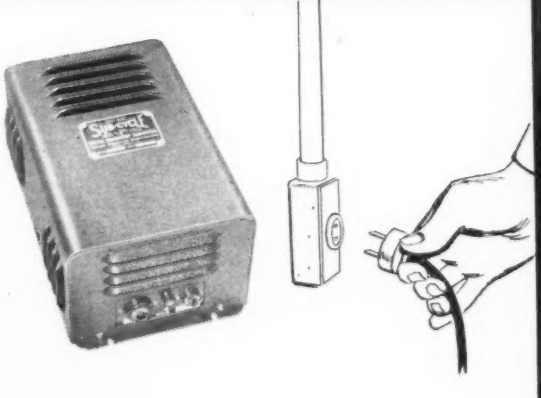
Cat. No.	Type	Each
S-4874	Weatherproof	$14.25
S-4876	Non-weatherproof	11.83

A Telecode Relay



is what makes the Howler sound off. Standard coil windings are 1000 ohms. Furnished with condenser (A), or without condenser (B).

Cat. No.	Type	Each
S-6061	A	$15.18
S-6077	B	11.33



Just plug it in and forget it!

When you put in a Lorain Sub-Cycle you can forget about ringing machine maintenance, because Sub-Cycle contains no moving parts; nothing to wear or burn out. It provides a strong, steady, 20-cycle output that gives you dependable ringing even on the longest rural lines.

And Sub-Cycle is economical to operate—just a few cents' worth of power a day. Runs on 60 cycles, 105-125 volts AC. Models available for exchanges up to 100, 1600, and 4000 stations, plus models for special applications. Write or call us today for the Sub-Cycle that's best for you.

This safety award stands behind every Simplex jack

You can feel secure in knowing that the Simplex jacks you provide your workmen are the safest jacks in the industry. They are the only ones to have received the Gold Medal Award for Safety by the American Museum of Safety. These distinguished jacks for pole raising, cable-reel lifting, and for general utility work, are just a sample of the *Approved* supplies sold by Automatic Electric. For a complete selection of Simplex jacks and other supply items call the nearest Automatic Electric warehouse.

Buy Automatic's *Approved* Supplies

Recommended and sold through our distributors

AUTOMATIC ELECTRIC

Distributors in U. S. and Possessions: AUTOMATIC ELECTRIC SALES CORPORATION
Export Distributors: International Automatic Electric Corporation
1033 West Van Buren Street, Chicago 7, U. S. A.

A. C. HERBERT
Executive Vice President

national average of one employe per 80 telephones."

There were only five Independent company rate increase applications filed in 1954, and only three so far this year. The secretary next described numerous clouds on the legislative horizon. He said, "It is significant to note that a major investment advisory service told its clients to sell their stocks of Pennsylvania utility companies as a result of these administration bills. If the market for our securities is destroyed, the net result will be higher utility rates, not lower as the governor predicted."

Mr. Herbert concluded with an announcement about the change of association headquarters, scheduled to take place the latter part of August. The new address is the Payne-Shoemaker Building, Third and Pine Sts., Harrisburg.

Dr. John H. Furbay, director of Air World Education, in his address "Two Worlds for Sale" (Communist vs. Free World) told of having seen the installation of the first telephone in Liberia. Up to that time he said his office employed six messengers and it sometimes took two weeks to deliver a message.

He declared the Korean War was unique in world history, and that it was won by the free world even if the peace was unsatisfactory. The Berlin blockade was also a failure, but although both communist attempts by force proved futile their cold war has been more successful. In Dr. Furbay's opinion the final winner will be the side that convinces the world they have the best answer to world problems.

One of these problems is hunger. He said two-thirds of all people are undernourished. He predicted there will be no atom bombs, but the battle will be for men's minds. The communist peace is simple — like a jail; there is no chance for war in a prison, no choices to make behind the Iron Curtain. The speaker referred to the Olympic games scheduled for 1956 in Australia, and said that Russian athletes will have been in full-time training for three years—and getting paid for it. They are told they must win in every event. If they do, they will become national heroes and be given pensions for life, whereas, failure to capture top honors will mean relegation to the salt mines. It will be tough for our amateur entrants to compete successfully against such "pros," Dr. Furbay concluded.

A panel discussion with K. B. Schotte, Kittanning, as moderator, consisted of brief talks on accounting by E. J. Burns of Ridgway; commercial by Thomas J. Schultz of Erie; plant by A. David Doverspike of Kittanning, and traffic by Mrs. Betty Hutchinson of Dallas.

Mr. Burns emphasized the importance of monthly financial statements. He said it is extremely important for management to have up-to-date information as to the condition of the company, particularly with respect to "rate of return" due to the regulatory lag with which "we are all familiar." Rate of return should be calculated each month and furnished to management as a part of the financial statement.

Mr. Schultz warned against the danger of neglecting public relations while concentrating on sales promotion. He urged participation in community affairs, as an effective means of fostering good public relations; also opening the plant for inspection frequently.

Mr. Doverspike covered such items as the installation of semi-postpay stations, outdoor public paystations, right-of-way clearance and private line service.

Mrs. Hutchinson spoke on nationwide long distance dialing. She said centralized routing bureaus, such as provided by Bell System companies, will relieve small exchanges.

A brief question and answer period followed. Then the four speakers organized discussion groups, separating and assembling in different corners of the convention hall. At the plant group considerable attention was given to use of subscriber carrier for serving rural business concerns.

A. L. Edmonds, research director of Pennsylvania State Chamber of Commerce, spoke on "Pennsylvania's Fiscal Problems." He said taxes represent one-third of all personal income. Pennsylvania, he stated, has the highest state debt and the budget for 1955-6 is over 1¼ billion dollars. State aid

ETHEL CUNNINGHAM
Secretary

to education is one main reason for the fiscal problem. He gave various arguments favoring a state sales tax on retail sales over a state income tax.

In his address entitled, "Let Your Light So Shine," Leon F. Roberts, director of information of the United States Independent Telephone Association, laid emphasis on the value of the USITA national advertising program which was launched last year. He also listed the items which occasioned the increase in the association's budget: The national advertising program, employment of a director of information and the employment of an additional engineer who will deal with toll compensation.

The final speaker was Philip Lovejoy, past general secretary of Rotary International. He spoke on "The Human Factor in Business," stating there are four powerful desires which motivate everyone: (1) Wish for security; (2) wish for response; (3) wish for recognition; (4) wish for new experiences. As an example of the human factor, the case of "Helen, the stenographer" was related. It was obvious she had little taste for her work and one day her boss asked her bluntly, "You don't like your job, do you?" "I hate it," she replied. "Then what would you like best to do, of all work available?" he inquired. Her answer was: "I know it's impossible, but I'd like to be a doctor and get into research."

Mr. Lovejoy told how a scholarship was arranged and now the once unhappy stenographer is doing great things in cancer research. He concluded with the statement, "If you don't try to make money too fast, you make it faster."

(Please turn to page 47)

On warm summer days—and throughout the year—having *enough* telephones in the *right* places is a real convenience. And you'll like the way the new colored telephones fit your decorating schemes.

new kinds of

TELEPHONE CONVENIENCE

for indoor-outdoor living

A wall telephone in your kitchen, workshop or garage is convenient, saves space as well as steps—and costs little extra.

A plug-in telephone goes with the modern concept of gracious outdoor living. It's ideal for terrace or patio.

An outdoor bell signal (shown with cover closed) keeps you within earshot of the telephone while in the yard or garden. Can be switched on or off as needed.

To find out about these and many other telephone services available, mail the coupon below or call the nearest business office of your Bell telephone company. Beauty note: *before you build or remodel, arrange for concealed telephone wiring with your architect or builder. This brings lasting protection to the beauty of your woodwork and walls.*

BELL TELEPHONE SYSTEM

Dept. BH-10, 195 Broadway, New York 7, N. Y.

Please send me a free copy of the booklet on home telephone conveniences.

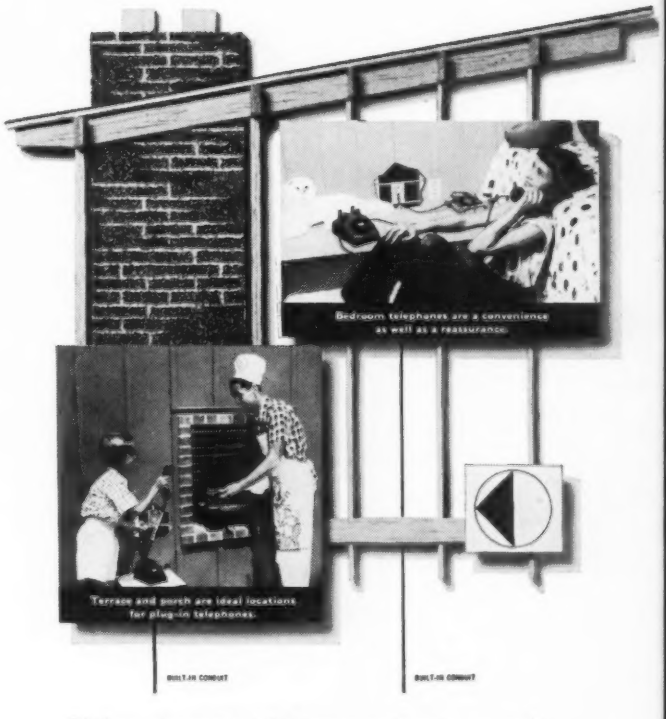
Name _____

Address _____

City _____ *Zone* _____ *State* _____

Seen by millions
in "home" magazines

Appears in "trade" magazines
read by architects and builders


Bedroom telephones are a convenience as well as a reassurance.
Terrace and porch are ideal locations for plug-in telephones.
BUILT-IN CONDUIT
BUILT-IN CONDUIT

Modern, step-saving telephone conveniences are marks of thoughtful construction especially when you install built-in conduit. Wire-free walls add to the salability of a home and the satisfaction of its owner. Include telephone conduits in the homes you build.

Your Bell telephone company will be glad to help you work out economical conduit installations. For details on home telephone wiring, see Sweet's Light Construction File, catalog 8i/Be, or just call your nearest business office. **BELL TELEPHONE SYSTEM**

construction and maintenance DIGEST

- **Block that bolt**
- **Profitable noise**
- **Pennies for power**
- **Free book tells all**
- **Wire winks at weather**

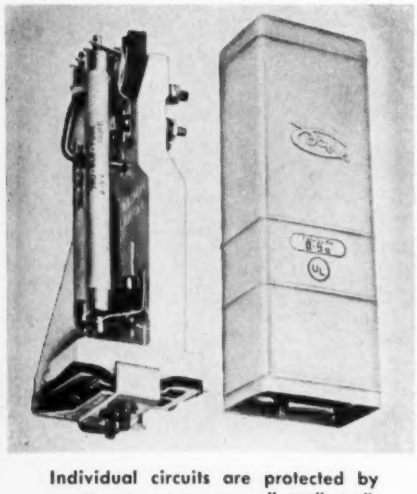
Published every week to help you get the most out of your materials and supplies dollar

by C. J. Reynolds, Stromberg-Carlson

The few dollars you spend on *reliable* equipment today will be repaid a hundredfold in lower maintenance costs for years to come. Protect your investment with the double guarantee offered by Stromberg-Carlson. First, leading manufacturers build this equipment, and guarantee it. Second, because we recommend and sell this equipment to the telephone industry, we *also* guarantee its performance!

Protect telephones from lightning

No larger than a good-size candy bar is the Cook 09u telephone protector shown here. But it can save you a lot of grief and you can protect single circuits, both indoor and out.



Individual circuits are protected by small unit, measuring 6"x2½"x1¾".

The body is a single piece of heavy white glazed porcelain. Lightning arrestors are two Tru-Gap dischargers, two flat carbons mounted on a copper ground, and two A-9u 7-amp. lavite fuses. Neoprene gasket locks out insects, dust, snow, etc.

Noise can be money!

Take a business subscriber who has a telephone in some extremely noisy location—and who has finally decided to do something about it. Would you rather have him spend money in building a soundproofed booth—or give **you** the money as monthly income on a telephone which completely licks the noise problem?

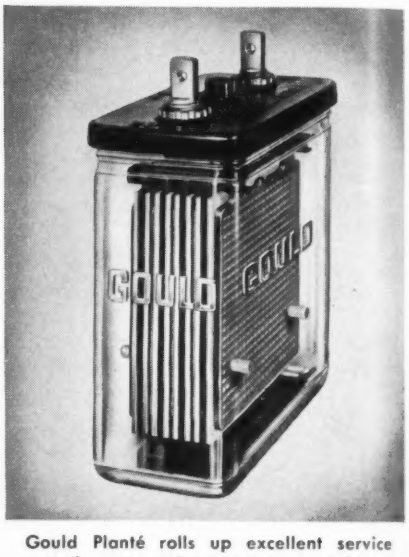
The GAI-PHONE is such an instrument. It has a special transmitter that actually creates a "Zone of Quiet" around the handset—even in a spot as noisy as a boiler factory!

It costs the subscriber **less** than a booth—and you get the revenue!

Ask us for complete details.

Battery has lowest yearly cost

There's an easy way to save money on switchgear, signal and alarm systems or emergency light and power applications.



Gould Planté rolls up excellent service records—cuts maintenance to a minimum.

Amazing service records have proved that Gould Planté batteries have the lowest yearly cost of any battery you can use. Pure lead positive plates help make this possible.

For top operating economy, ask your Stromberg-Carlson representative for Gould Planté—the Aristocrat of Stationary Batteries.

Like to know more about Telephone Cable?

Then get your free copy of the Kennecott Telephone Cable handbook. This book contains a concise description of the construction of Kennecott Telephone Cable and

Textile Insulated Cable for terminating and interphone use.

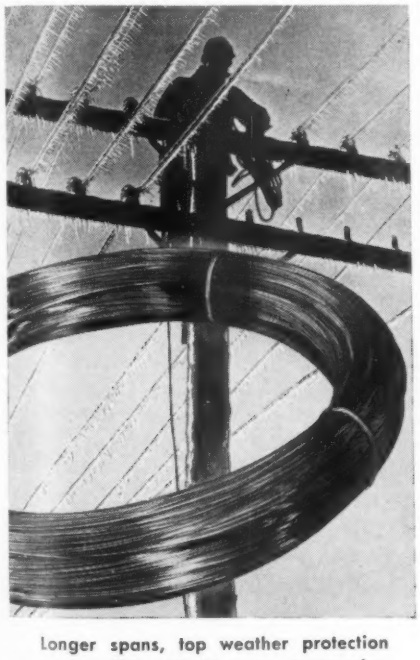
It also includes specifications for Paper Insulated, Dry (core) Lead Encased Telephone Cable, and tables showing lead thicknesses, approximate outside diameter, weights per thousand feet, and standard reel lengths.

Specify Kennecott – distributed by Stromberg-Carlson.

How to laugh at ice, wind

Ice and wind can play havoc with your service—and maintenance costs—when line wire is too weak to withstand the onslaught of weather.

To save the nuisance and expense of excessive service calls, we have available a wire of exceptional strength—rustproof Copperweld Line Wire, a tried and true friend



Longer spans, top weather protection are possible with this extra-strong wire.

of telephone men all over the world.

Its rugged strength permits longer spans, with greater protection against storm damage. Its copper covering provides better transmission characteristics than any other high-strength conductor.

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LET'S TALK FIRE PROTECTION

Concluded from page 23

trical conductivity as air. Direct the stream at the fire so as to blanket it.

Other Extinguishers

Many other kinds of extinguishers are manufactured and are available on the market. But many of these are for special situations. The four which are described are best adapted for fire first-aid.

In selecting a fire extinguisher, it never pays to take a chance. Consult the local fire chief or fire prevention bureau as to the type best suited to the hazards involved. It is best to buy extinguishers which have been approved by the Underwriters' Laboratories, Inc., or Factory Mutual Laboratories for the specific type of fire for which control is planned.

In conclusion, first-aid fire extinguishers are essentially what the name implies—apparatus provided close at hand to be used where needed. They are designed to cope with fires in their incipient stage. There is no reason to expect them to act as a substitute for automatic carbon dioxide or dry chemical systems, sprinklers, standpipes or the municipal fire department.

Decisive events continue to remind us that the strength and wealth of the nation depend primarily upon the extent to which resources are conserved.

Uncontrolled fire ranks high among the major forces that destroy life and property.

Fire can be controlled. Its destructive effects can be reduced to a minimum, but this cannot be done by a single organization. It is a job for everyone.

What Do You Want to Be?

"You may be whatever you resolve to be. Determine to be something in the world, and you will be something. 'I cannot,' never accomplished anything; 'I will try,' has wrought wonders."—J. HAWES.

FACTS ABOUT FIRE EXTINGUISHERS

Type of extinguisher	Extinguisher effect	Effective with fires of Class A	B	C	How to operate	Length of discharge	Recharge	Protection from freezing
PLAIN WATER								
Pump tank	cooling	yes	no	no	pump by hand	30 to 40 feet	after use	approved anti-freeze chemicals may be added to water
Gas cartridge	cooling	yes	no	no	turn over, bump on ground	30 to 40 feet	after use	
WATER AND CHEMICALS								
Soda-acid	cooling	yes	no	no	turn over	30 to 40 feet	annually	keep in heated cabinet if building is unheated—never add anti-freeze
Foam	cooling smothering	yes	yes	no	turn over	30 to 40 feet	annually	
Loaded steam	cooling oxidation inhibiting	yes	yes	no	turn over, bump on ground	30 to 40 feet	after use	none needed
CHEMICAL								
Vaporizing liquid	smothering	*	yes	yes	pump by hand	20 to 30 feet	after use	none needed
Carbon dioxide	smothering	*	yes	yes	open valve at top	3 to 6 feet	after use	none needed
Dry compound	smothering	*	yes	yes	open valve at top	8 to 12 feet	after use	none needed

*Effective only on small surface fires.

You can reduce unit loss and use of repeaters with

CEECO LOADING COILS

From an economic and service standpoint, the use of telephone cables in place of open wire circuits are generally preferred. However, attenuation resulting from the higher series resistance of the cable circuits, and their higher capacitance and reduced inductance poses a problem. This is where loading coils such as manufactured by CEECO are used. By applying coils on telephone circuits, the unit loss can usually be reduced to one-third or one-fourth the non-loaded value. For example, by using the proper loading, a 24 gauge cable pair can be made as satisfactory as a non-loaded 19 gauge cable pair having three times as much copper. Other advantages are that it is possible to avoid the use of repeaters in many cases by extending the transmission range or to employ fewer repeaters. The voice frequency loading coils are primarily designed for use on two-wire telephone circuits in non-quadded paper insulated or plastic cables. Coils can be furnished for quadded inter-office trunks and toll entrance cables.

WRITE FOR CIRCULAR 654-A

BUCKEYE TELEPHONE & SUPPLY CO.

1250 KINNEAR RD. **COLUMBUS 21, OHIO**

Courts and Commissions

N. C. Commission Declines To Order Extended Area Service

In deciding against ordering Carolina Telephone & Telegraph Co. of Tarboro, N. C., to provide extended area service between Warrenton, Norlina and Macon, the North Carolina Utilities Commission said on June 20 that not enough telephone subscribers affected were interested to pay the extra costs.

Sought by the "Warren County Telephone Unification Committee," the arrangement would have made it possible for residents of the three communities to call each other without paying long distance tolls, but would have required an increase in their monthly exchange rates.

At a hearing last March, the commission heard the committee's request, and ordered the company to poll subscribers of the three exchanges. Carolina T&T sent out 1,153 ballots. Of those returned, it was found that 591 were in favor of the plan and 438 against it.

The commission held that the "simple majority registered does not justify subjecting the minority to the higher telephone rates and charges proposed." The majority was insufficient, it said, "to warrant ordering 438 of the company's subscribers to pay higher rates and charges for telephone service in order that 591 of the company's subscribers might have a class or type of service preferred."

General of the NW Secures Raised Rate Schedule

Washington Public Service Commission approved on June 20 higher rates for the General Telephone Co. of the Northwest (TELEPHONY, July 2, p. 32).

Put into effect on June 21, the new rates affect all Washington exchanges of the company except Farmington and Palouse. They are designed to boost the company's annual gross revenue $173,941. The new rates, before taxes are applied, follow:

Benton City, Brewster, Bridgeport, Cusick, Enterprise, Entiat, Fairfield, Garfield, Hunters, Ione, Kettle Falls, Latah, Mansfield, Metaline Falls, Oakesdale, Palisades, Peshastin, Plymouth, Reardon, Rockford, Soap Lake: One-party business, $8.25, one-party residence, $5.05, and four-party residence, $3.35.

Cashmere, Chewelah, Davenport,

Leavenworth, Medical Lake, Newport, Quincy, Rosolia, Tekoa, Waterville: One-party business, $9.25, one-party residence, $5.30, and four-party residence, $3.80.

Chelan: One-party business, $10.25, one-party residence, $5.55, two-party residence, $4.55, and four-party residence, $4.05.

Pullman: One-party business, $11.25, one-party residence, $5.80, two-party residence, $4.85, and four-party residence, $4.35.

Kennewick and Wenatchee: One-party business, $13.25, one-party residence, $6.30, two-party residence, $5.45, and four-party residence, $4.95.

New York Commission Defers Action on Bell Interim Plea

The New York Public Service Commission shelved the New York Telephone Co.'s request for a temporary 34-million-dollar increase in rates, pending court action on a petition for a permanent increase (TELEPHONY, June 25, p. 38).

Commission Chairman Benjamin F. Feinberg noted in a statement that the commission had applied to the court of appeals for permission to appeal a lower-court decision that directed the commission to reopen hearings on a permanent rate boost of $68,850,000. The commission had denied the increase.

"The commission will take no action on the company's interim rate request until the court of appeals has acted," Mr. Feinberg said.

The company asked the commission on June 15 for permission to raise rates, effective Aug. 1, as a "stopgap" measure.

Mo. Mutual, REA-Financed, Seeks Dial Rate Approval

Grand River Mutual Telephone Corp., Princeton, has applied to the Missouri Public Service Commission for approval of a schedule of dial rates for its Mercer exchange, it was reported on June 9.

An REA-financed company, Grand River will serve approximately 120 subscribers with dial equipment it has just had installed. Dial rates asked are:

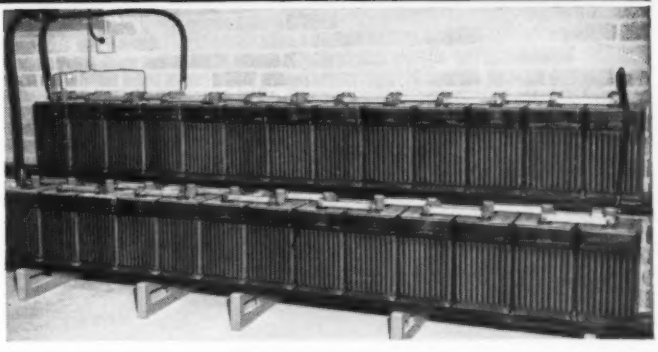
One-party business	$7.75
Two-party business	7.00
One-party residence	4.50
Two-party residence	4.00
Rural business	5.00
Rural residence	3.50

NW Bell Takes Over Independent

Northwestern Bell Telephone Co. has taken over the Roome Rural Telephone Co., a subscriber-owned line switched by the Bell exchange at Crookston, Minn. It is reported that the Bell com-

At Southeast Nebraska Telephone Company

It's C&D Batteries for EXTRA life



New C&D Battery installation at Falls City, Nebraska. The Southeast Nebraska Telephone Company has a string of C&D PlastiCal (lead-calcium) cells here—capacity 540 A. H.

Just installed—but with a long, long life ahead—are these C&D PlastiCal Batteries for The Southeast Nebraska Telephone Company. Their job: to provide dependable, round-the-clock service for the busy Falls City area, an important town in the great Cornhusker State.

Like many telephone properties, Southeast Nebraska depends on C&D for reliability. The next time you order batteries, specify C&D. For with C&D you get:

1. **One-piece, permanently-sealed plastic case. Entire unit is shock-resistant... lighter and more compact than glass or rubber.**
2. **Elimination of sudden leaks due to internal stresses.**
3. **Easier maintenance, because patented Post Seal eliminates acid creepage.**
4. **Lower shipping costs. Light plastic case reduces total in-place cost.**

For C&D Batteries—consult your Equipment Supplier.

For details and specifications — write for Bulletins T-527 and T-528.

C&D

BATTERIES, INC.
of Conshohocken, Pa.
Manufacturers of Industrial Batteries since 1906

SALES AND SERVICE OFFICES IN PRINCIPAL CITIES FROM COAST TO COAST

Pat. Pend.

*KLEIN KUT PLIERS

for both regular and heavy-duty cutting

It was Klein that produced the first and still the finest regular side-cutting plier. Klein also gave the industry the modern, streamlined version so much in demand.

And it's Klein again with a new, high leverage cutting plier for light- or heavy-gauge wire, including No. 2 weatherproof hard drawn solid copper wire, and A.C.S.R.

There's no extra hinging of any kind—no uncomfortable wide-spread handles—with this new Klein-Kut Plier. The offset hinge permits the extra-high leverage and operation is as smooth and easy as with any other Klein Plier. Forged from high-grade tool steel, individually fitted, tempered, adjusted and tested. Ask for No. 213-9 N.E. for streamlined pattern.

Regular pattern available

Same high-leverage design, but in the original Klein side-cutting pattern. Ask for No. 213-9.

Write for free Copy of Bulletin 1054

*Trade Mark

ASK YOUR SUPPLIER

Foreign Distributor: International Standard Electric Corp., New York.

"Since 1857"

Mathias Established 1857 KLEIN & Sons Chicago, Ill., U.S.A.

7200 McCORMICK ROAD • CHICAGO 45 ILLINOIS

pany will install $30,000 in new equipment and cable in the area.

New York Independent Gains Permission to Raise Rates

The New York Public Service Commission has accepted a tariff amendment filed by Margaretville Telephone Exchange designed to increase rates effective July 1 (TELEPHONY, June 25, p. 44). The company serves about 1,100 stations.

In filing its new tariff, the company reported that with the creation of a new water supply reservoir for New York City within its service area and the consequential flooding-out of Shavertown, Arena, Union Grove and Dunraven, it has lost more than 100 subscribers who have moved to other areas.

It also reported that it is planning to install automatic equipment in Margaretville and has been engaged in the rehabilitation of its outside plant. Total cost for such work during 1953 and 1954 aggregated $33,300.

Kansas Company Asks to Buy; Another Seeks Rate Raise

The Kansas Corporation Commission has set hearings on applications of two telephone companies for changes in operations.

Haviland Telephone Co. has applied for permission to buy the exchanges at Isabel, Sawyer and Nashville from Southwestern Bell Telephone Co. The hearing is scheduled for July 15.

The company has requested permission to borrow $277,000 more from REA and sell $27,600 in preferred stock to finance the transaction.

On July 18 the commission will hear the application of Suburban Telephone Co., Tonganoxie, for an increase in rates of $19,014.

The company's application for an REA loan already has been approved, it is reported, and work has started in converting to dial.

Missouri Company Asks to Buy

Application of the Urbana Telephone Co. to purchase the Hermitage Mutual Telephone Co. properties was received on June 27 by the Missouri Public Service Commission.

Illinois Co-Op Asks to Sell

The Illinois Commerce Commission was scheduled to hear on July 6 the application of the Boone County Cooperative Telephone Co., to sell to General Telephone Co. of Illinois, Springfield.

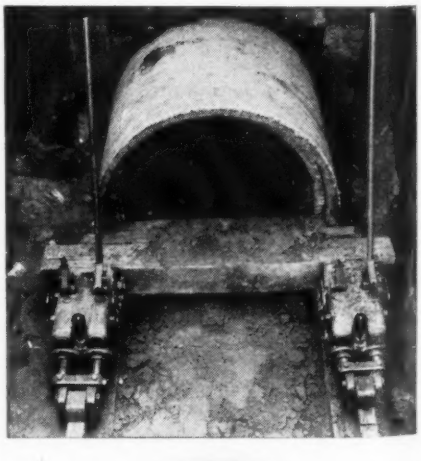
Minnesota Co-Op to Be Sold

The Minnesota Railroad & Warehouse Commission on June 27 author-

FAST, EASY WAY TO INSTALL PIPE... AT LOWER COST

PUSH PIPE UNDERGROUND WITH A GREENLEE HYDRAULIC PUSHER

Here's the simple, cost-cutting way to install underground pipe. Speed your jobs with a GREENLEE Pusher. One-man-operated, portable, simple to operate. No tearing up of pavement . . . eliminates extensive ditching, tunneling, backfilling, tamping, repaving. Cuts job time to a fraction. GREENLEE Hydraulic Pipe Pusher often pays for itself on first job. Two sizes — model shown above for pushing 3/4" to 4" pipe. Larger unit, below, for pipe over 4", concrete sewer pipe and large drainage ducts. Power pump (as shown above) also available for extra ease and speed of operation.



TOOLS FOR CRAFTSMEN
GREENLEE

Write today for descriptive literature. Greenlee Tool Co., 2067 Columbia Avenue, Rockford, Illinois, U.S.A.

ized the sale of the Ellendale Cooperative Telephone Association to the Minnesota Telephone Co.

Two Kansas Independents Go After Rate Raises

Applications of two Independents to raise rates were taken under advisement on June 24 by the Kansas Corporation Commission.

Consolidated Telephone Co., Burrton, requested a $12,345 annual increase in rates. The company serves 1,577 subscribers.

Riverdale Mutual Telephone Co., serving 76 rural subscribers, is seeking $960 a year increase in rates.

Independent Man Purchases Two Arkansas Exchanges

Howard B. Fine has purchased the Rison and Kingsland exchanges of the Cleveland County Telephone Co., Rison, from Van Graham. The sale has been approved by the Arkansas Public Service Commission, it was reported on June 11. The incorporators are Mr. Fine, Elsie Edna Fine and Mrs. James Sheffield.

Improvements in the exchanges are planned, including the extension of rural lines as fast as they are found feasible, Fine said.

Fine was formerly vice president of the Neale Construction Co., Inc. and Telephone & Power Supply Co., Topeka, Kan.

Gov. Leader Signs Party Line Bill for Pennsylvania

Gov. George M. Leader signed a bill on June 24 aimed at "party line hogs" who refuse to surrender their telephones for emergency calls (TELEPHONY, June 18, p. 28). There is a $50 fine for the first offense. Further offenses could result in a $300 fine and 30 days in jail.

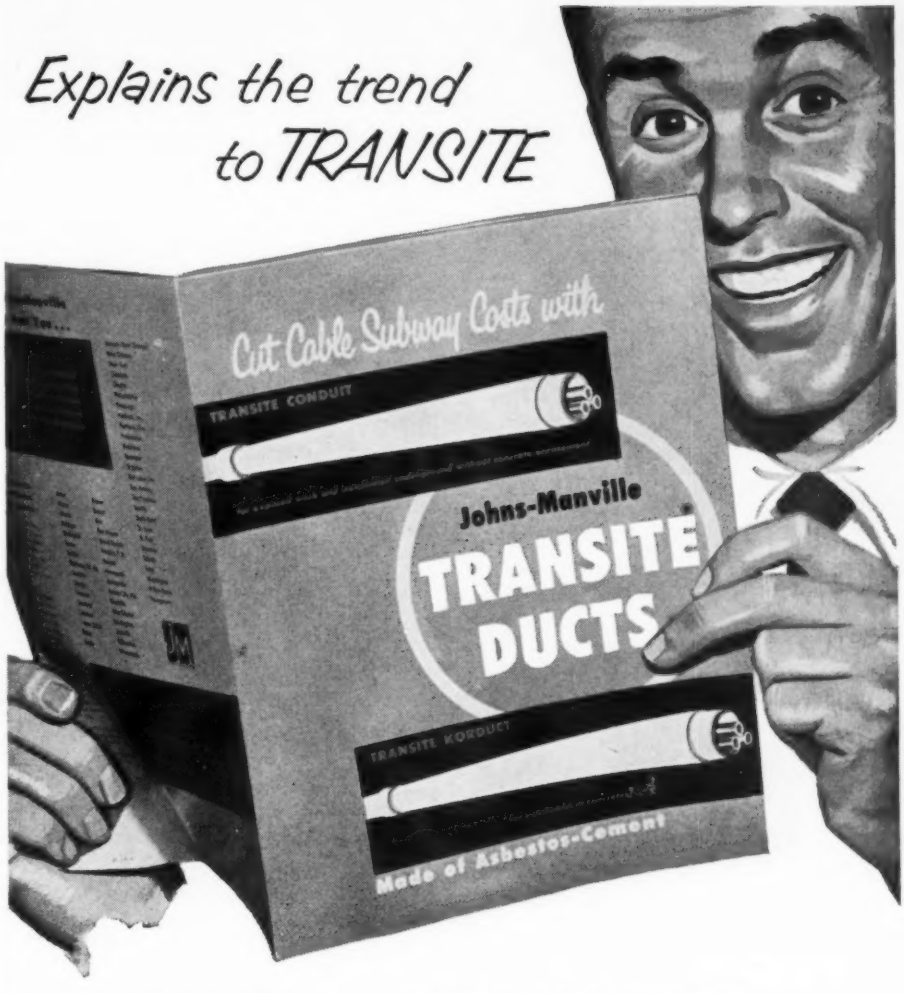
A person falsely stating that the line is needed for an emergency call is subject to a $50 fine.

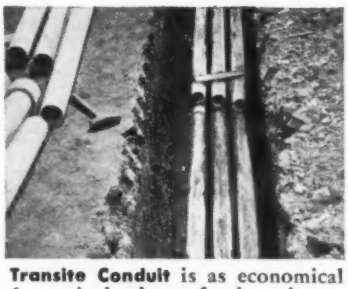
Emergency Party Line Use Law Placed in Effect in Ohio

Ohio's emergency party line use law went into effect on June 30, it was reported.

The law provides penalties for "hogging" a party line when it is needed for an emergency call—for firemen, police, doctors and such.

The penalties, fines up to $500 and jail sentences up to 30 days, also apply to those who falsely claim an emergency to get possession of a line.





Transite Conduit is as economical for main banks as for lateral construction. It also saves maintenance.

Unusually corrosive soil required Transite Duct to replace another type in this telephone cable system.

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THIS EASILY READ BOOKLET tells why more and more telephone companies now use Transite® asbestos-cement ducts—an improved, permanent type of cable protection that costs less. The ducts, being inorganic and nonmetallic, cannot rust . . . are immune to electrolysis . . . resist soil corrosion. They withstand all normal stresses. Thus, maintenance is practically eliminated.

Transite Ducts save installation costs. The sections, being 10 feet long, mean fewer joints in the completed line. Lightweight, easily handled, they are readily assembled and disassembled.

In direct buried lines, the tight joint provided by Transite Conduit excludes water and silt from duct interior. This eliminates cleaning of ducts. Additional savings are realized by pneumatic rodding instead of the hand rodding that is necessary with less effective joints that, being less effective, permit leakage.

Other features of Transite Ducts are also covered in the new booklet, EL-29A. Write Johns-Manville, Box 60, New York 16, N. Y. In Canada, 565 Lakeshore Rd. E., Port Credit, Ontario.

Johns-Manville TRANSITE DUCTS

1955 CONVENTIONS

Michigan Independent Telephone Association, Pantlind Hotel, Grand Rapids, Sept. 8 and 9.

Rocky Mountain Telephone Association, Hotel Utah, Salt Lake City, Utah, Sept. 15 and 16.

Arkansas Telephone Association, Arlington Hotel, Hot Springs, Sept. 26 and 27.

Tennessee Telephone Association, Hermitage Hotel, Nashville, Sept. 29 and 30.

United States Independent Telephone Association (annual convention), Conrad Hilton Hotel, Chicago, Oct. 10, 11 and 12.

North Carolina Independent Telephone Association, The Carolina Hotel, Pinehurst, Oct. 17 and 18.

Oklahoma Telephone Association, Huckins Hotel, Oklahoma City, Oct. 20 and 21.

Virginia-West Virginia Independent Telephone Associations (joint convention) Hotel Roanoke, Roanoke, Va., Oct. 20 and 21.

South Carolina Independent Telephone Association, Clemson House, Clemson, Oct. 24 and 25.

South Dakota Telephone Association, Cataract Hotel, Sioux Falls, S. D., Nov. 3 and 4.

Alabama-Mississippi Telephone Association, Thomas Jefferson Hotel, Birmingham, Ala., Nov. 14 and 15.

Georgia Telephone Association, DeSoto Hotel, Savannah, Nov. 17 and 18.

Florida Telephone Association, Daytona Plaza Hotel, Daytona Beach, Nov. 21 and 22.

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North Dakota Mutual Elects Officers, Permanent Board

Raymond G. Vendsel of Carpio, N. D., is the president of the Souris River Telephone Mutual Aid Corp., Velva, following a recent re-organization meeting at which a permanent board of directors was elected.

Vice president of the group is Raymond Fegley of Berthold. John Campbell of Minot is secretary-treasurer and Vernon Carlson, assistant secretary-treasurer.

Other directors include Walter Wunderlich of Voltaire, Engwald Rosendahl of Westhope, John Sveund of Towner, Ardine Ness of Tolley and Wesley Ortman of Martin.

Boards of Two Iowa Companies Approve Consolidation

The boards of directors of Clemons Mutual Telephone Co. and St. Anthony Cooperative Telephone Association, both of Iowa, voted to merge the companies and install dial equipment to afford "better communications," it was reported on June 9. Name of the new company is Clemons-St. Anthony Telephone Co., Inc.

The corporation's board of directors is comprised of an equal number of representatives from both communities. Leo Dunn, president of the Clemons mutual, is corporation president, while A. T. Heil, president of the old St. Anthony company, is corporation vice president. Janet A. Paterson of Clemons, is secretary-treasurer.

Other directors are: Virginia Borton and Harold Weuve of St. Anthony; E. W. Shives and Vinton A. Davis of Clemons; Ralph Pfantz of State Center; Arnold Riese of Colo; Donald Bartine of Clemons; Gene Griffiths of State Center; and E. T. Van Metre of Clemons.

Preferred Issue Marketed By United of Pennsylvania

United Telephone Co. of Pennsylvania's 15,000-share (1.5-million-dollar) issue of 4½ per cent, $100 par, cumulative preferred stock is on the market. Kidder, Peabody & Co. and associates have priced the shares at par and accrued dividends.

Proceeds, together with about one million dollars from the sale of 20,000 common shares to United Utilities, Inc., the parent company, will be used to repay bank debts and advances owed to the parent. All indebtedness was incurred in connection with the company's construction program.

THE PROS AND CONS OF LEAD CALCIUM BATTERY

Continued from page 20

of maintenance for the lead calcium battery if the new battery replacing the lead antimony is also a lead calcium.

STATEMENT. **Lead calcium cells must be floated above 2.15 volts per cell.**

FACT. False. Lead calcium cells can be floated at any voltage the lead antimony cells are floated. Less frequent equalizing charges will be necessary, however, if voltage is raised to 2.17 or, if possible, as high as 2.20. Recommended voltage is 2.17 volts which gives more leeway before any cells drop to below 2.13 volts at which point an equalizing charge is recommended.

STATEMENT. **The life expectancy of the lead calcium cell on full float (voltage regulated bus between 2.15 and 2.20 volts per cell) is in excess of 25 years.**

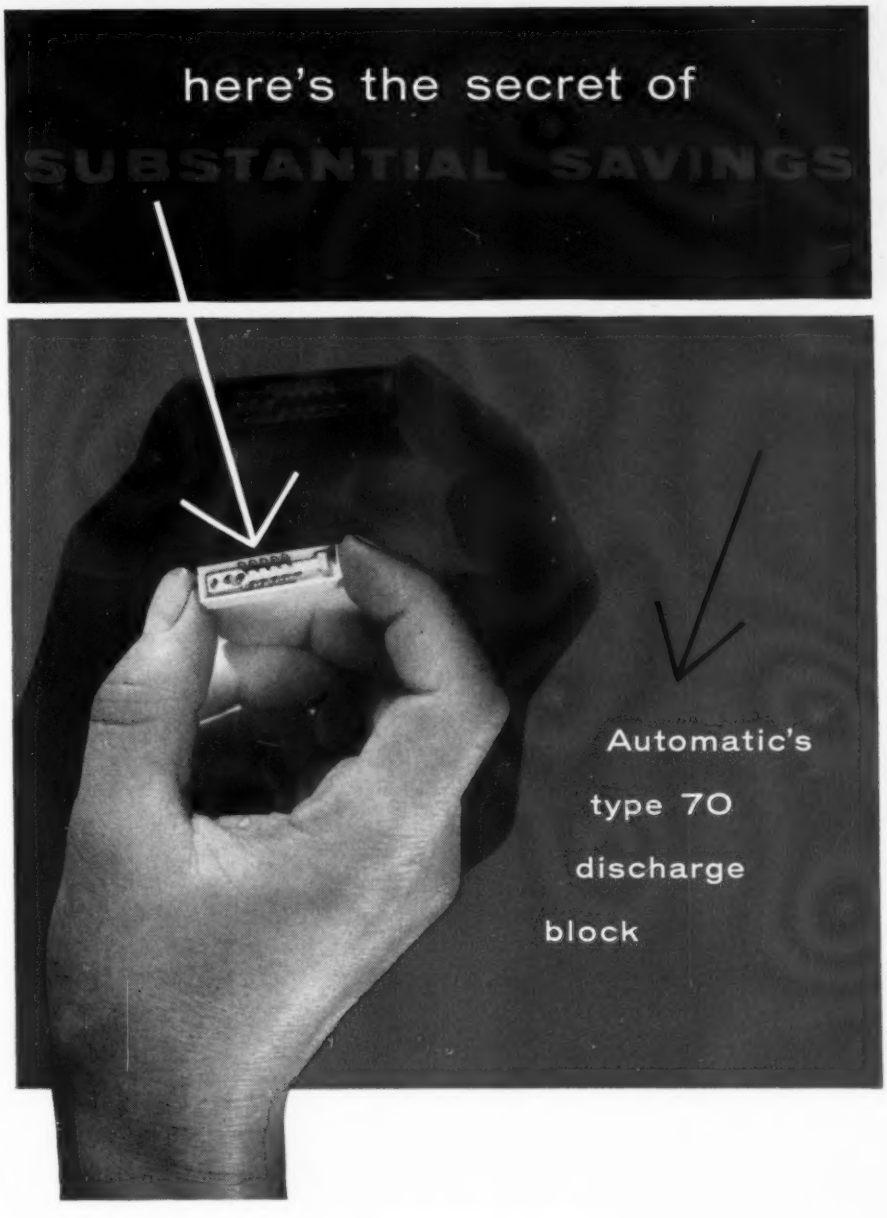
FACT. True. The life of a battery on full float operation is dependent upon the corrosion rate of the positive grid. Since the lead calcium cell does not have the marked side reactions encountered in a lead antimony cell (caused by the deposition of the antimony on the negative plate) it requires only 1/10 to 1/75 as much current to float it. This greatly reduced current therefore results in markedly reduced corrosion rate, hence, greatly increased life.

STATEMENT. **The lead calcium battery is not recommended for trickle charge* operation.**

FACT. Calcium lead cells can be satisfactorily trickle charged if precautionary measures are taken to assure that the trickle rates are set sufficiently low to prevent overcharging. As indicated above since the lead calcium cell requires only about 1/10 the current necessary to hold any given voltage as compared to a conventional lead antimony cell, care must be exercised to ascertain that the trickle rates are properly set.

Usually, however, trickle charge equipment does not have ammeters with indicating scales with sufficiently low ranges to indicate the low rates required by the lead calcium cells. In such instances, the operating personnel should set the rates by observing the voltmeter over a sufficient period of time (several weeks) to maintain the voltage per cell between 2.15 and 2.20 volts. (Preferably two ammeters should

*Note: Trickle charging is differentiated from float charging, because in trickle charging the current through the battery is manually set at a constant value (such as in constant current charging), whereas in float operation the current through the cell depends upon the cell requirements to hold a given voltage. Compensation for temperature changes are automatic in full float operation.



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Order Cat. No. SC-10 (.003" gap) for substation protectors and distributing frames. Operates within UL requirements.

Order Cat. No. SC-11 (.0055" gap) for cable terminals and crossarm arresters.

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EXCESSIVE groundwater was just one of several special problems on this underground duct system at the new college campus at Goleta, Calif.

Future roads made special reinforcing in the trench necessary, and plans required running both telephone and power circuits side-by-side.

Soapstone OCT-O-DUCT was the easy, inexpensive answer to every problem. Many thousand feet of 3-inch and 4-inch duct were laid in the same trench.

OCT-O-DUCT's low price and low installation cost, combined with its outstanding electrical, chemical and mechanical characteristics, have made it first choice with contractors and construction departments in telephone and power utilities throughout the West.

Write for Specifications Bulletin 54A and for Installation Manual 54B.

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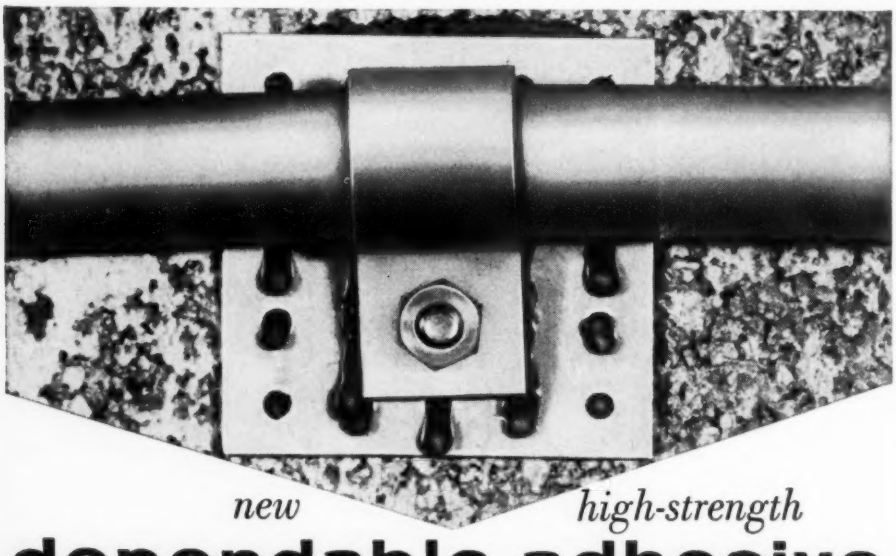

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A complete line of wire and cable hangers is available in either stainless or galvanized steel. Send for bulletins on both adhesive and hangers.

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be utilized; one with a scale 1/10 the range of that of the standard ammeter to be used for trickle charging with a cut-over switch to insert the standard ammeter for boost charging.)

In installations where wide fluctuations in temperature are encountered, the rates should be set for the highest average temperature experienced over a sufficiently extended period such as one to two weeks at such temperatures. The cell voltage will then exceed the recommended values of 2.15 to 2.30 volts per cell when the temperature drops to normal. If the cells exceed 2.25 volts per cell then the rates should be reset after the period of high temperature has expired.

It has been found that frequently the controls on the trickle charge equipment may not permit sufficiently small increments in current range to fall within the limits necessary to hold 2.15 to 2.20 volts per cell. In such cases modification to the equipment was accomplished by adding another rheostat with smaller increments to the control circuit.

The additional life or reduced maintenance obtained from the lead calcium battery on a floating system, utilizing a voltage control bus held between the limits of 2.15 and 2.20 volts per cell, cannot be obtained with a trickle charging system unless the operating personnel is sufficiently careful to maintain the trickle current at the necessary values to hold the recommended voltage range. The life and maintenance of any lead acid cell on a trickle charge system is completely dependent upon the human equation for maintaining the proper trickle rates.

The life of the lead calcium cell in trickle service should, however, be considerably greater than that obtained from the lead antimony cell if the rates are reduced to about one-tenth of that normally used for the lead antimony cell. Setting the rates to these values will also reduce maintenance required for water additions proportionately, providing evaporation is not a large factor.

The Equitable Arrangement

"The long-term solution to the TVA and any other government-owned business is this: (1) Any government-operated business should pay its equal share in tax money if it is competing in any way with privately owned business. (2) The federal government should get completely out of the power business since it must either nationalize all of the nation's power, or favor the nationalized regions at the expense of other regions whose taxpayers are paying for the competition."—Ashtabula (O.) *Beacon.*

NEED FOR MERCHANDISING

Concluded from page 34

Association directors elected for the coming year were: C. E. Eaby of Ephrata; A. M. Gibson of Sheffield; W. M. Gottschall of Lansford; Zeno Henninger of Butler; Harold G. Payne of Export; G. B. Rudy Jr. of York; K. B. Schotte of Kittanning; R. B. Scott of Waynesburg; A. N. Seward of Jamestown, N. Y.; L. F. Shepherd of Erie; H. Y. Smith of Columbia; A. J. Sordoni Jr. of Dallas; J. K. Stoltzfus of Birdsboro, and L. R. Thurston of Harrisburg.

Officers elected by the directors were: President, Mr. Schotte; vice presidents, Mr. Smith and Mr. Scott; treasurer, Mr. Rudy; executive vice president, A. C. Herbert of Harrisburg, and secretary, M. Ethel Cunningham of Harrisburg.

The Keystone State Chapter of the Independent Telephone Pioneer Association met and heard Chapter president W. P. Strickenburg's message. Following the reports of officers and committees, the following chapter directors were elected: Willis A. Black of Butler; Paul L. Cowan of Erie; Mr. Strickenburg of Meadville; Daniel Seitz of York, and A. S. Watson of Oil City.

Chapter officers for the new year are: President, Mr. Watson; vice president, Mr. Seitz; secretary, Mrs. Mary Hadlow of Erie, and treasurer, Mrs. Bertha B. Eaby of Ephrata. The chapter membership now stands at 497.

IN THE NATION'S CAPITAL

Continued from page 26

further hearings by the commission. On a request for rehearing the court, again unanimously, reversed its own decision and confirmed the commission's ruling. On the second petition for rehearing, the commission's action was again sustained, but by a one vote margin in the court.

The company now asks that the higher rate being collected under bond be continued as an emergency measure until permanent rates can be set and the commission can again determine the alleged inadequacy of the 1953 rates.

Paying Close Attention

"Diligence, as it avails in all things, is also of the utmost moment in pleading causes. Diligence is to be particularly cultivated by us; it is to be constantly exerted; it is capable of effecting almost everything."—CICERO.

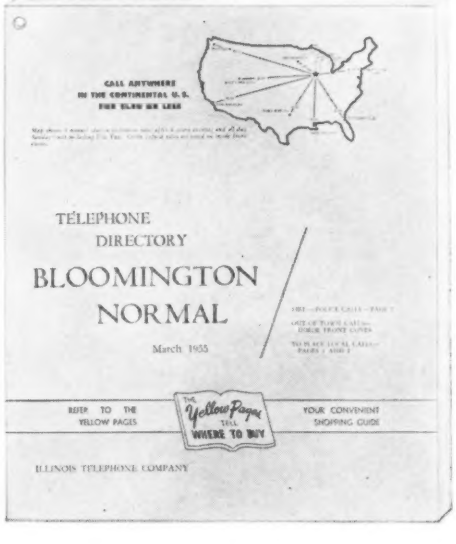
W. K. Eno Elected President Nebraska Chapter of Pioneers

W. Kent Eno of Lincoln was elected president of the Frank H. Woods Chapter, Independent Telephone Pioneer Association, in a statewide election in Nebraska conducted by mail in May. The results of the election were announced

W. K. ENO

at the chapter's annual reunion at Lincoln on June 4. Mr. Eno succeeds A. B. Gorman of Lincoln.

Other officers elected were R. V. Clif-



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The Following Can Be Furnished in "J" or "K" Type PBX Switchboards:

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If you are planning on a dial conversion and want to get your outside plant in shape before installing dial central office equipment, Kellogg Rebuilding Department will rent manual central office equipment until installation is made of new equipment.

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Serviceable for all around uses. Standard everywhere.
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Smooth texture, easy to handle. Preferred for switchboard use.
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Very popular because easy to keep clean. Moisture and grease proof.

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...for every purpose!
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Take your choice—Neoprene, Nylon or Cotton. They're all high quality cords made in accordance with Runzel high standard of quality. We carry large stocks of cords to meet every need. Our geographical location means Quick Service.

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ford, vice president; R. D. Andrews, secretary, and Almyra Metcalf, all of Lincoln. They succeed Mr. Eno, Marie Vidlock and Mr. Clifford, respectively.

Elected to the executive committee for three-year terms were Tyler Ryan of Lincoln and Robert Gray of Seward.

At the annual meeting Mr. Gorman reported an all-time high in membership of 521, a net gain of 20 since June 1954. A club within the chapter for retired members was formed with Bert R. Overcash as chairman. This group meets twice monthly for social purposes and also conducts regular visits to homebound members. A fund-raising campaign by the chapter resulted in a net profit of $588. This fund is on deposit, and after a sufficient amount has accumulated it will be used for the furnishing of a club room or for some similar purpose.

About 350 attended the annual banquet and reunion with the attendance representing companies in nearly all parts of the state. About 20 telephone companies in Nebraska are represented in the chapter's membership.

Americans Own America Through Widespread Stock Ownership

The New York Stock Exchange is seeking to broaden share ownership among the people of this country. Its theme is "Own Your Share of American Business." In this connection, it suggests that stocks should not be bought until the investor has established an emergency fund in the form of a savings account or government bonds, and purchased an adequate amount of life insurance.

Why is it desirable that many million Americans of moderate means put a part of their savings into stocks? There are two reasons, both compelling.

It is estimated that more than 11 million people will join the civilian labor force in the next 10 years. The creation of a single job in industry requires an average investment of some $13,700. By 1965, the annual level of business spending for plant and equipment should reach 60 billion dollars—almost 60 per cent above the 1954 figure. To soundly handle this growth, it is estimated that new common stock financing will have to be increased to 5 billion or 6 billion dollars a year—three or four fold the present rate. Wealthy families and financial institutions simply can't supply that much investment—the money just isn't there. It can only be obtained from the resources of the many, not the few.

The second reason was expressed by the stock exchange's president in these words: "Wide shareownership will reinforce, more than any single factor I can think of, our free and enterprising business system. The person who owns a share in a business has a direct and continuing interest in the success of that business. From that base it is a simple step to work toward preserving and strengthening the system which guarantees his right to ownership. To me it is a source of continuing pride that any man or woman in the United States has the right to buy one share or a hundred in one of our great corporations, to raise a voice in the management of the business, to accept the risks and earn the rewards that go with ownership." And that is the most important reason by far. — *Industrial News Review.*

South Dakota Independent Purchased by Co-op

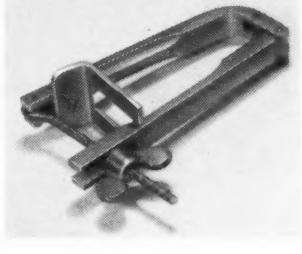
The Sully-Buttes Cooperative Co., Highmore, S. D., has purchased the Missouri Valley Telephone Co., also of Highmore, according to announcement by L. J. Ollig, president of the Missouri Valley company.

Pending approval of the sale by the South Dakota Public Utilities Commission, the co-op assumed operation about July 1, according to Mr. Ollig.

Opportunists, Note

"Live only for today, and you ruin tomorrow."—C. SIMMONS.

product of the month



B CABLE SHEATH CONSTRICTOR

This Dodge product is used for forming compression rings in lead cable sheath. Has 2 arms hinged at one end, with wing nut at opposite end. Arm stop locates tool for contact with cable sheath. Two sets of hinge holes provided for tool adjustment with cables up to 2¾" diameter. Wt. 2 lbs.

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General Cable Announces Expansion Program

General Cable Corp. of New York City has entered into a contract for the purchase of a telephone wire manufacturing company, completed plans for the construction of a new cable manufacturing plant, and made arrangements for the formation of a new com-

I. T. BENNETT

pany to manufacture telephone wires and cables in Canada, according to an announcement made on June 23 by I. T. Bennett, chairman of the board and J. R. MacDonald, president.

General Cable has entered into a contract for the acquisition of General Insulated Wire Works, Inc., of Providence, R. I.

With the acquisition of this additional plant, General Cable adds a new

J. R. MacDONALD

line of products to include rubber, neoprene and plastic power supply cords with molded-on rubber or plastic attachment plugs and devices, electrical cord sets, bulk lamp cords and portable power cords.

"These new products will contribute greatly to General Cable's continuing program of broadening the scope of services to all branches of the growing electrical industry," Mr. MacDonald said. In addition, this new property will substantially increase our capacity for producing the already broad line of telephone and communication wires." The company's communication wires for the telephone industry include a complete range of inside and outside telephone wire in addition to telephone headset cords.

C. J. Craig, president of General Insulated Wire Works, will be appointed a vice president of General Cable, with principal responsibility for the Providence operation. The newly-acquired plant occupies approximately 100,000 square feet and employs about 300 people. The plant has a weekly capacity of several million feet each of single conductor rubber jacketed and braided types of wire and an equivalent amount of plastic single conductor feet, and

C. J. CRAIG

can produce millions of rubber and plastic molded terminal parts.

The new cable manufacturing plant will be constructed in Monticello, Ill.

Approximately 35 acres have been acquired for a modern plant specifically designed to meet the expanding requirements for paper telephone cable. The new plant will occupy some 50,000 square feet. It will be equipped with completely modern manufacturing facilities. New units will be added as necessary to meet the needs for additional production of General Cable products, Mr. MacDonald stated.

"This new manufacturing facility will increase General Cable's production of paper telephone cable by approximately 25 per cent," Mr. MacDonald said. He went on to state that the initial plant facilities, specifically designed for manufacturing telephone

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1 to 12	55 Cents Each
13 to 100	50 Cents Each
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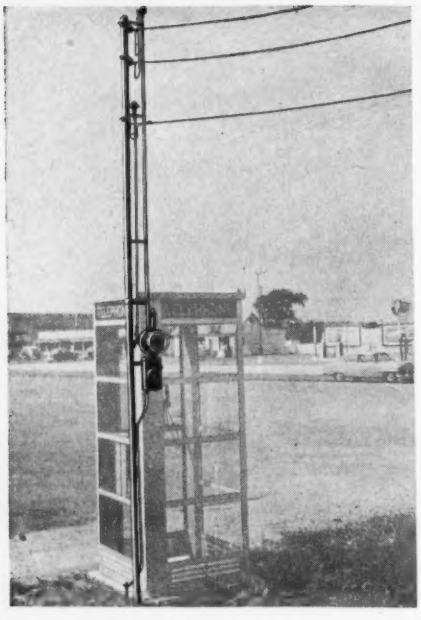

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Fits any outdoor booth, meets all specifications.

Looks better, lasts longer, costs less. One man can install this mast in less than 30 minutes.

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TEST EQUIPMENT

Locates Line Trouble Fast

LINEMAN'S TEST SET.....(Model H)
CABLE TESTER.....(Model L)
LOCATOR-TESTER.....(Model A)
EXPLORING COIL AMPLIFIER
(Model E)
MIDGET DETECTO-METER
(Model D-1)

STEWART BROTHERS
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Chicago 10, Illinois

cables, will be completed by November and in full operation by the end of the year.

R. E. Riggin, presently assistant plant manager at General Cable's St. Louis factory, will take over the management of the new plant.

Mr. MacDonald announced the completion of arrangements with Canada Wire & Cable Co. Ltd. for the formation of a new company to manufacture a complete line of telephone wires and

R. E. RIGGIN

cables in Canada. The new company, Telecables and Wires Ltd., will be owned jointly by General Cable, Canada Wire & Cable and the British firm of Telegraph Construction and Maintenance Co. Ltd.

General Cable will have a substantial minority interest. "Our extensive engineering and manufacturing experience in telephone wires and cables will be made available to the new firm," Mr. Bennett stated. Canada Wire & Cable Ltd. will operate the new company plant, which will be in full operation within one year. The factory is expected to be located in or near Winnipeg.

Officers of the new company are: Chairman of the board, J. R. Bradfield, president of Canada Wire & Cable Co. Ltd. and executive vice president of Noranda Mines; vice chairman, Mr. Bennett; president, O. W. Titus, vice president of Canada Wire & Cable Co. Ltd.; vice president, Mr. MacDonald; vice president, L. G. Lumbers, vice president of Canada Wire & Cable Co. Ltd. These officers, plus a representative of Telegraph Construction & Maintenance Co. Ltd., will serve on the board of the newly-formed company.

By the end of the year General Cable Corp. will have increased its manufacturing facilities to eight plants in the United States. These are located in Bayonne and Perth Amboy, N. J.; Rome, N. Y.; St. Louis, Mo.; Los Angeles and Emeryville, Cal.; Providence, R. I., and Monticello, Ill.

Data Systems Research Manager Named by Stromberg-Carlson

Beryl Lee McArdle, project engineer in the research department at Stromberg-Carlson Co., has been appointed manager of data systems research, according to Lynn C. Holmes, director of research.

Mr. McArdle was born in Galene, Mich., and attended the Michigan Col-

B. L. McARDLE

lege of Mining and Technology where he graduated in 1935 with a degree in electrical engineering.

Prior to joining Stromberg-Carlson, he was employed by the United Steel & Wire Co., Battle Creek, Mich.; and from 1943 to 1947 served as head of the research section on cryptographic communications in the U. S. War Department.

In 1947 he became a member of the Stromberg-Carlson research department where he has been engaged in research activities associated with highly classified communications equipment. Mr. McArdle has eight classified patent applications in the field of pulse communication and security systems.

Mr. McArdle is a senior member of the Institute of Radio Engineers, and a member of the executive committee of the Rochester Section of this national society.

Add New Radio-Telephone Link

Radio-telephone service from East Africa is now available to Poland (via London), it was reported recently